

# **CAREER CENTER** **COURSES**

**Course Description:** The Jobs for Montana's Graduates (JMG) program assists Montana high school students to stay in school, graduate and successfully make the transition from school to work. The JMG model is designed to identify 11th and 12th grade students most at risk of dropping out of school and seniors most at risk of unemployment after graduation, to prepare them for meaningful career-oriented jobs, to match these students with community job opportunities, and to provide long term follow-up for nine months after graduation.

**Essential Requirements:**

- Employability Skills Curriculum – Career Development, Job Attainment (getting a job), Job Survival (keeping the job), Basic Competencies (including basic math, reading, writing), Leadership and Self-Development and Personal Skills.
- Montana Career Association - a motivational student organization which fosters the development of leadership, decision-making, and assertiveness skills, provides recognition for achievement, and builds self-esteem.
- Job Development and Placement – Job Shadowing and signing up for Job Service activities.
- Post Graduation follow-up - graduates and their employers are provided with nine months of follow-up assistance.
- Active and productive partnership between business and education.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Prerequisite Courses:** None

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Course Description:** Student work involves the study of human medicine, research processes, an introduction to bioinformatics, and the use of computer science, mathematics and information theory to model and analyze biological systems. Students investigate the human body systems and the various health conditions including diabetes, sickle-cell disease, hypercholesterolemia, heart disease, and infectious diseases. They determine the factors that lead to the death of a fictitious person, and investigate lifestyle choices and medical treatment that might have prolonged the person's life. Key biological concepts, including homeostasis, metabolism, inheritance of traits, feedback systems, and defense against disease are embedded in the curriculum. Engineering principles, including experimental design process, feedback loops, and the relationships of structure to function, are incorporated in the curriculum. Students should expect assignments and homework to build the new knowledge base in biomedical science--including medical terminology, and fundamentals of biochemistry, anatomy, physiology, and genetics--and learn technical writing skills for medicine and science. This course is designed to provide an overview of all the courses in the biomedical program, and lay the scientific foundation for the subsequent courses of Human Body Systems, followed by Medical Interventions. Regular attendance in class is key to successful progressive learning in this course. Because this course is not textbook-based, it is essential that students consider their source of and access to computers and internet outside of class.

Student performance in this course is also utilized to access appropriate progression in biomedical science curriculum, i.e., Human Body Systems and Medical Intervention. The top 7 skills you'll develop in Biomedical Sciences - (see link)

<https://www.bahsbiomed.com/top-7-skills/>

#### **Essential Requirements:**

- Demonstrate basic math (including addition, subtraction, multiplication, division, and calculating percentages), writing, and reading skills.
- Demonstrate an ability to follow written and verbal instructions.
- Demonstrate an ability to work well in small groups with peers.
- Demonstrate an ability to work independently and be self-motivated, including appropriate use of time provided in class, as well as managing time and workflow outside of school hours to complete assigned tasks in the time allotted.
- Demonstrate an ability to follow lab safety protocols.
- Demonstrate an ability to perform basic computer skills.

In the event of over enrollment **first criteria** for consideration shall be prior year's daily attendance, followed by performance in prior science, math, and English courses. Note: Attendance is required and documented.

#### **ONE – HOUR CLASS**

#### **STUDENTS MAY ENROLL IN FALL ONLY**

#### **Prerequisite Courses:**

- Successful completion of grade level: appropriate science class.
- Successful completion or concurrent enrollment in biology is highly encouraged
- Successful completion of grade-level appropriate math class
- Successful completion of all previous years of English class

#### **Applies toward graduation requirements of: 1 Career Technical Education Credit**

- Concurrent enrollment in PBS and HBS is only allowed with the course instructor/administrator approval.
- Attendance is very important to a student's success in this course.
- Strongly recommended that students have a home computer and internet access.
- If the student does not have a computer and/or internet access, the instructor will make arrangements for students to be successful without having these components available at home.

**Course Description:** By exploring science in action, students work through real-world medical cases by researching prevention and treatment options of common systemic diseases, designing and carrying out experiments, investigating structures and functions of the human body, dissecting a number of organs and body parts, and using data acquisition equipment and software to monitor a variety of body functions. Over 40 related healthcare careers are embedded in the activities performed. This course challenges students to think critically through a combination of active learning activities and labs. As a result there is very little time devoted to lecture. Students should expect assignments and regular homework to build the new knowledge base in biomedical science—including medical terminology, and fundamentals of biochemistry, anatomy, physiology, and genetics—and learn technical writing skills for medicine and science. This course is similar to “Anatomy and Physiology” courses. It is designed to provide scientific foundation for the subsequent biomedical science course, Medical Interventions.

The six units cover the following specific concepts: **Identify** (anatomical and directional terminology, overview of all body systems, histology, skeletal system, forensic anthropology, DNA/PCR/gel electrophoresis, biometrics); **Communication** (brain, nervous system, action potential, eye anatomy and physiology, hormones and endocrine system); **Power** (enzymes, macromolecules, digestive system, metabolism, respiratory system, urinary system); **Movement** (joint types, ROM, muscle anatomy and physiology, circulatory system, exercise physiology, athletic training); **Protection** (integumentary system, burns, bone injuries, x-rays lymphatic and immune system, blood types, immunology); **Homeostasis** (review all body systems, health and wellness; reproductive system).

#### Essential Requirements:

- Demonstrate basic math including addition, subtraction, multiplication, division, calculating percentages, algebra, and graphing and analyzing data, writing, and reading skills.
- Demonstrate an ability to follow written and verbal instructions.
- Demonstrate an ability to work well in small groups with peers.
- Demonstrate an ability to work independently and be self-motivated, including appropriate use of time provided in class, as well as managing time and workflow outside of school hours to complete assigned tasks in the time allotted.
- Demonstrate an ability to follow lab safety protocols.
- Demonstrate an ability to perform basic computer skills.

In the event of over enrollment, **first criteria** for consideration shall be the grade attained both semesters of PBS (suggested a 'C'; or above both semesters to be successful in this course) as well as excellent attendance in that course and overall school attendance, followed by performance in prior science and math courses.

#### ONE – HOUR CLASS

#### **STUDENTS MAY ENROLL IN THE FALL ONLY**

Students in this course should be taking or plan to take higher level math and science for four years of high school. Students should be in the top 1/3 of their class. Students should be interested in pursuing a degree in science, math, or technology--i.e., in research, laboratory, or clinical medicine. Other important traits are: self-motivated, strong work ethic, good time management, interest in medicine and enjoyment in finding creative solutions to problems.

#### **Prerequisite Courses:**

- Successful completion of PBS with a “C” or better both semesters or instructor/administrator approval
- Concurrently enrolled in biology or successful completion of biology
- Successful completion of grade-level appropriate math class
- Successful completion of all previous years of English class

#### **Applies toward graduation requirements of:** 1 Career Technical Education Credit

- ❖ Concurrent enrollment in PBS and HBS is only allowed with the course instructor/administrator approval OR concurrent enrollment in HBS and MI (if PBS was successfully completed with a 'C' or better both semesters) is only allowed with instructor/administrator approval.
- ❖ Attendance is very important to a student's success in this course.
- ❖ Strongly recommended that students have a home computer and internet access
- ❖ If the student does not have a computer and/or internet access, the instructor will make arrangements for students to be successful without having these components available at home.

**Course Description:** Students investigate a variety of interventions involved in the prevention, diagnosis, and treatment of disease as they follow the lives of a fictitious family. Students explore how to 1) prevent and fight infection; 2) screen and evaluate the code in human DNA; 3) prevent, diagnose, and treat cancer; and 4) prevail when the organs of the body begin to fail. These scenarios expose students to the wide range of interventions related immunology, surgery, genetics, pharmacology, medical devices, and diagnostics and therapeutics, and class activities are heavily weighted in laboratory medicine techniques. Each family case scenario introduces multiple types of interventions and reinforces concepts learned in the previous two courses, as well as presenting new content, ranging from simple diagnostic tests to treatment of complex diseases and disorders, providing a look at the past, present, and future of biomedical sciences. Lifestyle choices and preventive measures are emphasized throughout the course, as are the important roles scientific thinking and engineering design play in the development of interventions of the future. Students are also engaged in considering and debating the bioethics of applying new scientific knowledge and capabilities and related health policy, such as in genetic engineering.

Students should be taking or plan to take higher level math and science for four years of high school. Students should be in the top  $\frac{1}{3}$  of their class. Students should be interested in pursuing a degree in science, math, or technology -- i.e., in research, laboratory, or clinical medicine. Other important traits are: self-motivated, strong work ethic, good time management, interest in medicine and enjoyment in finding creative solutions to problems.

**Essential Requirements:**

- Demonstrate competent to proficient math (including algebra, and graphing and analyzing data), writing, and reading skills.
- Demonstrate an ability to follow written and verbal instructions.
- Demonstrate an ability to work well in small groups with peers.
- Demonstrate an ability to work independently and be self-motivated, including appropriate use of time provided in class, as well as managing time and workflow outside of school hours to complete assigned tasks in the time allotted.
- Demonstrate an ability to follow lab safety protocols.
- Demonstrate an ability to perform basic computer skills.

Strongly recommend access to internet and computer outside of class.

In the event of over enrollment, **first criteria** for consideration shall be current daily attendance, followed by performance in prior biomedical science courses. NOTE: Attendance is required and documented.

**ONE – HOUR CLASS****STUDENTS MAY ENROLL IN THE FALL ONLY****Prerequisite Courses:**

- Successful completion of PBS and HBS with a “C” or better both semesters of both classes or instructor/administrator approval
- Successful completion of biology
- Successful completion of grade-level appropriate math class
- Successful completion of all previous years of English class

**Applies toward graduation requirements of:** 1 Career Technical Education credit

- ❖ Concurrent enrollment in HBS and MI (if PBS was successfully completed with a “C” or better both semesters) is only allowed with instructor/administrator approval.
- ❖ Attendance is very important to a student’s success in this course.
- ❖ Strongly recommended that students have a home computer and internet access
- ❖ If the student does not have a computer and/or internet access, the instructor will make arrangements for students to be successful without having these components available at home

**Course Description:** Provides students with a basic understanding of human anatomy and physiology. Concepts of the body plan and homeostasis will be introduced. Students will also learn the basic structure, function, and interaction of the integumentary, skeletal, muscular, nervous, endocrine, blood, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems. The lab portion of the course helps students apply the knowledge base of structure and function of the human body organs and systems. This course is a dual credit course and with successful completion, four (4) college credits will be awarded at City College-MSU Billings. This course is the equivalent of BIOH 104 Basic Human Biology (3 credits) and BIOH 105 Basic Human Biology Lab (1 credit) at City College-MSU Billings. As such, students should anticipate and prepare for a rigorous pace of new concepts and medical terminology, with regular assessment processes through both semesters.

**Essential Requirements:**

- Demonstrate competent to proficient math (including algebra, and graphing and analyzing data), writing, and reading skills.
- Demonstrate an ability to follow written and verbal instructions.
- Demonstrate an ability to work well in small groups with peers.
- Demonstrate an ability to work independently and be self-motivated, including appropriate use of time provided in class, as well as managing time and workflow outside of school hours to complete assigned tasks in the time allotted.
- Demonstrate an ability to follow lab safety protocols.
- Demonstrate an ability to perform basic computer skills.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance followed by performance in prior science and/or biomedical science courses. NOTE: Attendance is required and documented.

**ONE-HOUR CLASS**

**STUDENTS MAY ENROLL IN THE FALL ONLY**

**Prerequisite Courses:**

- Successful completion of grade-level appropriate Math classes
- Successful completion of all previous years of English classes
- Successful completion of prior science classes with grade of 'C' or better.

**Applies toward graduation requirement of:** 1 Career Technical Education Credit

- ❖ Attendance is very important to a student's success in this course
- ❖ Strongly recommended that students have a home computer and internet access
- ❖ If the student does not have a computer and/or internet access, the instructor will make arrangements for students to be successful without having these components available at home

<b>College Medical Terminology</b>	<b>Credit 1/2</b>	<b>11, 12</b>
<b>Course Name</b>	<b>3 Credits @ City College MSU-B</b>	<b>Grade Level</b>
	<b>Semester 1 or 2</b>	

**Course Description:** This one-semester course introduces the student to the specialized language of the medical profession and builds a background vocabulary in this area using a word-building system which provides a solid foundation for understanding medical terms. Basic word-building concepts are taught with emphasis on spelling, pronunciation, and definitions.

This course is a Dual Credit course and with successful completion of the semester, 3 credits of college credits will be awarded at City College MSU-Billings. As such, students should anticipate and prepare for a rigorous pace of new word roots and concepts, with regular assessment processes throughout the semester. This course is the equivalent of AHMS 144 Medical Terminology (3 credits) at City College-MSU Billings.

**Essential Requirements:**

- Demonstrate competent to proficient writing and reading skills.
- Demonstrate an ability to follow written and verbal instructions.
- Demonstrate an ability to work independently and be self-motivated, including appropriate use of time provided in class, as well as managing time and workflow outside of school hours to complete assigned tasks in the time allotted.
- Demonstrate an ability to perform basic computer skills.

In the event of over-enrollment, first criteria for consideration shall be current daily attendance, followed by performance in prior science and/or biomedical science courses. NOTE: Attendance is required and documented.

**ONE HOUR CLASS**

Prerequisite Courses:

- Successful completion of all previous years of English classes.
- Successful completion of grade-level appropriate Math classes.
- Successful completion of prior science and language classes with grade of 'C' or better. Highly recommended.

Applies toward graduation requirement of: 1 Career Technical Education Credit

\*Attendance is very important to a student's success in this course.

**Course Description**

Concepts and practices in basic skills for Nursing Assistants. Course includes basic medical terminology, basic human anatomy and physiology, and the aging process. Students will gain understanding and application of the skills required to address the needs of the chronically ill residents. This course will prepare students for state examinations required for a Certified Nursing Assistant Certificate. This course will include both classroom hours and practical application.

**Course Topics**

- Role and responsibility of the nurse aide in long term care.
- Basic rights and needs.
- Communication.
- Resident's physical environment
- Personal care of the resident.
- Resident safety and emergency care.
- Death and dying
- Nutrition and fluid balance
- Prevention and control of infection
- Personality and behavior
- Basic anatomy and physiology
- Meeting the needs of special residents

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE HOUR CLASS**

\*Students will have to provide own transportation for training opportunities and requirements off campus.

**Prerequisite Courses:**

- Successful completion of Biology 1

**Applies toward graduation requirements of:** 1 Career Technical Education credit



**Course Description:** This course is a combination of the academic study of Human Anatomy and Physiology along with Applied Medicine. The Applied Medicine portion of the class provides student with hands-on experiences in hospital and clinical settings and exposure to over 50 health care professions. The class meets daily at Billings Clinic. This course is a partnership with Billings Clinic, St. Vincent Healthcare, and RiverStone Health. Students must complete an application from their home schools for admittance into this course.

**Essential Requirements:**

- Strict adherence to HIPPA based confidentiality
- Adherence to hospital professional dress code
- Practice universal precautions
- Attendance to hospital rotations is mandatory

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**TWO – HOUR BLOCK****1<sup>ST</sup> OR 2<sup>ND</sup> SEMESTER – A.M. OR P.M. CLASS**

**Suggested Prerequisite:** Chemistry is recommended

**Prerequisite Courses:** Completion of 3 science credits. Must provide your own transportation

**Applies toward graduation requirements of:** Anatomy/Physiology = 0.5 science credit; Applied Medicine = 0.5 practical arts credit

**Course Description:** This course will prepare students for the state and national examinations required for Emergency Medical Technician certification, and will include both classroom hours and practical application. The course is designed for students desiring to perform emergency medical care. Students will learn to assess the seriousness of a patient's condition and the appropriate emergency medical techniques to stabilize the patient until hospital medical care can be received. The course covers theory and techniques; operational aspects of prehospital care; and the scope, responsibility, and safety of the EMT professional.

**Essential Requirements for EMT Certification and College Credit:**

- Students must maintain a 75% minimum grade on all tests and quizzes
- Successful completion of the course requires a minimum of 10 hours of patient observation with an approved clinical supervisor
- BLS certification
- Students may not have more than 10 total absences throughout the course of the academic year
- Strict adherence to HIPPA based confidentiality

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**STUDENTS MAY ENROLL IN THE FALL ONLY**

**Prerequisite Courses:** Successful completion of Biology 1.

**Suggested Prerequisites Courses:** Principles of Biomedical Sciences, Human Body Systems, Medical Interventions, Medical Careers (Anatomy & Physiology & Applied Medicine) Human Anatomy & Physiology

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Course Name: Introduction to the Operating Room**  
**Semester 1 & 2 (Year Long Class): Credit 1**

**Grade Level: 11, 12**

**Course Description:** Provides students with a basic understanding of the career fields that may interact and contribute to patient care services in the realm of the operating room (OR) and related perioperative services. This course introduces the operating room-based career fields by discussing the history of surgery, and the operating room environment as a microsystem within the context of the larger hospital system and organization. The course considers the special needs of surgical patients and the relevant standards of conduct, communication and teamwork, safety standards, and biomedical science applied in caring for surgical patients. This introduction to the operating room provides an orientation to the various roles and functions within the perioperative areas of preoperative, intraoperative, and postoperative care—including, but not limited to, physicians (surgeon, anesthesiologist), nurses, perfusionists, anesthesia technicians, surgical technologists, nurse and/or physician assistant surgical assistants.

Students should anticipate a rigorous pace of learning new concepts and team functions and interactions that will utilize both classroom and operating room simulation experience for training and assessment of performance progress through both semesters.

**Essential Requirements:**

- Demonstrate competence or proficiency in math (including algebra, and graphing and analyzing data), writing, and reading skills.
- Demonstrate an ability to follow written and verbal instructions.
- Demonstrate an ability to work well in small groups with peers.
- Demonstrate an ability to work independently and be self-motivated, including appropriate use of time provided in class, as well as managing time and workflow outside of school hours to complete assigned tasks in the time allotted.
- Demonstrate an ability to follow lab and OR safety protocols.
- Demonstrate an ability to perform basic computer skills.
- **NOTE: Attendance is required and documented.**
- NOTE ALSO: Successful completion of Principles of Biomedical Science and Human Body Systems is desirable, but not required.

In the event of over-enrollment, first criteria for consideration shall be current daily attendance followed by performance in prior science and/or biomedical science courses.

**ONE-HOUR CLASS**

**STUDENTS MAY ENROLL IN THE FALL ONLY**

**Prerequisite Courses:**

- Successful completion of grade-level appropriate Math classes
- Successful completion of all previous years of English classes
- Successful completion of prior science classes with grade of 'C' or better.

**Applies toward graduation requirement of:** 1 Career Technical Education Credit

- ❖ Attendance is very important to a student's success in this course.
- ❖ It is strongly recommended that students have a home computer and internet access.
- ❖ If the student does not have a computer and/or internet access, the instructor will make arrangements for students to be successful without having these components available at home.

## First Year

### Electronics 1 / Electric 1

(1st Semester - 2 Hour Class)

### Electronics 2 / Electric 2

(2nd Semester - 2 Hour Class)

Credit 1 (each semester)

11, 12

Course Name

Semester 1 & 2 (Year Long Class)

Grade Level

**Course Description:** This program prepares students with core knowledge and experience for a variety of careers related to the electrical and electronics fields. Students will learn through study and hands-on activities the principles and applications of electricity. The theory, design and testing of basic circuits and components is presented in the classroom and applied in the lab setting with 40-60% hands-on activities and labs. Students learn low and high voltage wiring principles and practices. These students have been involved in the wiring of the Career Center house project since 1975 and also installed the data, telephone and cable TV systems in the Billings high schools. Successful completion of the program has helped students to pursue career pathways, such as developing into; electricians, electronic technicians and electrical engineers.

### Units of Study:

- Math laws that help to control and analyze electronic circuits
- Electron theory and behavior of electricity
- Circuits design and behavior of components
- Measuring and analyzing circuit behavior
- Direct and alternating currents
- Mathematical calculations of electronics
- Semiconductor applications and operations
- Safe practices, codes, standards and designs in electrical circuitry

### Essential Requirements

- Solid understanding of basic algebra

In the event of over enrollment the **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Recommend:** Highly recommend completion of Algebra 2 (or current enrollment in Algebra 2).

### TWO – HOUR BLOCK / YEAR LONG CLASS

**STUDENTS MAY ENROLL IN FALL ONLY**

**Prerequisite Courses:** Students should have had at least a “C” in Algebra 1. Algebra 2 is recommended.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Second Year**

**Electrical Technician 1/Electronic  
Communication 1- 1<sup>st</sup> Semester**

**Electrical Technician 2/Electronic  
Communication 2-2<sup>nd</sup> Semester**

**Credit 1 (each semester)**

**11, 12**

**Course Name**

**Semester 1 & 2 (Full Year Course)**

**Grade Level**

**Course Description:** This is a continuation of the first-year program. Students will expand their studies into advanced electronics and electrical applications. Industry standard training systems will be used for advanced circuit analysis with emphasis placed upon AC systems, semiconductors, digital circuits, and advanced analysis techniques. Students will also pursue study of their own personal interest in electronics as approved by the instructor.

Units of Study:

- Advanced circuit analysis and design
- Circuit design and fabrication
- Semiconductor applications
- Pre-engineering electronics practices

**Essential Requirements**

- Completion of the first-year program with a “B” minimum grade
- Solid understanding of basic algebra

In the event of over enrollment the **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Recommended:** Algebra 2

**TWO – HOUR BLOCK / YEAR LONG CLASS**  
**STUDENTS MAY ENROLL IN FALL ONLY**

**Prerequisite Courses:** Students must have completed the first year program (semesters 1& 2) with at least a "B" and be accepted into the program by the instructor/administrator.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

## Botany

### Urban Agriculture

Credit 1 (each semester)

11, 12

Course Name

Semester 1 and/or 2

Grade Level

**Course Description:** This course is designed for the student that has a genuine interest in the “Green Industry” with an emphasis on plants and environmental factors that affect them. Learning will take place through a combination of indoor/outdoor laboratory activities. Many of the subjects include contextual experiences. Class projects may include designing and constructing a hydroponic garden, growing plants in the school greenhouse, design and install a landscape and sprinkler system in the “Spring Sem.” Holiday crafts for seasonal occasions including flower arrangements and centerpieces in the “Fall Sem.” Students study the relationships between plants, insects, and mammals. Other subjects that will be covered but not limited to; Careers in Horticulture, Plant identification, Lawn and grounds maintenance, Xeriscaping, Hydroponics and Aquaculture. Growing vegetables in the school’s greenhouses and gardens. In addition, students may be asked to participate in community and school projects.

#### Essential Requirements:

- Design and build a landscape and irrigation system
- Demonstrate floral and craft design
- Demonstrate plant identification
- Have knowledge of landscape, grounds maintenance, and pruning
- Identify pest and weed control techniques
- Demonstrate knowledge of environmentally safe practices
- Basic understanding of Hydroponics and Aquaculture

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

#### **TWO – HOUR BLOCK**

**Prerequisite Courses:** A passing grade must be earned to continue in the course 2<sup>nd</sup> semester.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

<b>Horticulture</b>	<b>Credit 1/2</b>	<b>11, 12</b>
<b>Course Name</b>	<b>Semester 1 and/or 2</b>	<b>Grade Level</b>

**Course Description:** The science of growing plants can be interesting and profitable. Working in the school's greenhouses, students will demonstrate an understanding of the techniques of growing plants; plant propagation through grafting and cutting techniques, germinating seeds and bedding plant production. Students will also demonstrate an understanding of the maintenance and operation of a greenhouse; the environmental controls i.e. heating, cooling and irrigation. The learner will apply basic skills in identifying pests and the proper use of a biological control. Other subjects include operating a hydroponic and aquaculture system, creating floral arrangements and holiday crafts. The students will achieve the basic knowledge for entry-level greenhouse, nursery, and florist positions.

**Essential Requirements:**

- Demonstrate plant identification
- Demonstrate plant propagation and grafting techniques
- Participate in bedding plant production
- Identify techniques for maintaining houseplants
- Prepare a cost analyses of operating a greenhouse in a Northern climate
- Design greenhouse structures and layout
- Identify techniques and materials used to control pests and disease

In the event of over enrollment **first criteria** for consideration shall be current daily attendance.

**ONE – HOUR CLASS**

**Class meets a.m. ONLY**

**Prerequisite Courses:** Genuine interest in Horticulture

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Introduction to Agriculture, Food, & Natural Resources (AFNR)**

**Credit 1**

**9,10, 11, 12**

**Course Name**

**Semester 1 & 2 (Year Long Class)**

**Grade Level**

**Course Description:** *Introduction to Agriculture, Food, and Natural Resources (AFNR)* introduces students to agricultural opportunities and the pathways of study in agriculture. Science, mathematics, reading, and writing components are woven in the context of agriculture and students will use the introductory skills and knowledge developed in this course throughout the CASE curriculum. Throughout the course are activities to develop and improve employability skills of students through practical applications. Students explore career and post-secondary opportunities in each area of the course.

Students participating in the *Introduction to Agriculture, Food, and Natural Resources* course experience hands-on activities, projects, and problems. Student experiences involve the study of communication, the science of agriculture, plants, animals, natural resources, and agricultural mechanics. While surveying the opportunities available in agriculture and natural resources, students learn to solve problems, conduct research, analyze data, work in teams, and take responsibility for their work, actions, and learning. For example, students work in groups to determine the efficiency and environmental impacts of fuel sources in a practical learning exercise.

The *Introduction to Agriculture, food, and Natural Resources* course serves as the introductory course within the CASE Program of Study. The course is structured to enable all students to experience an overview of the fields of agricultural science and natural resources so that students may continue through a sequence of courses through high school. The knowledge and skills students develop will be used in future courses within the CASE program.

In addition, students will understand specific connections between their lessons and Supervised Agricultural Experience and FFA components that are important for the development of an informed agricultural education student. Students investigate, experiment, and learn about documenting a project, solving problems, and communicating their solutions to their peers and members of the professional community.

**Essential Requirements:** The introduction to Agriculture, Food, and Natural Resources course includes:

- Agricultural Education - Agriculture, FFA, and SAE
- Communication Methods
- Science Processes
- Natural Resources
- Plants and Animals
- Agricultural Power and Technology

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE HOUR CLASS:**

**STUDENT MAY ENROLL IN FALL ONLY**

**Prerequisite Courses:** None

**Recommended:**

- Successful completion of grade level appropriate science class
- Successful completion of grade-level appropriate math class
- Successful completion of all previous years of English class

**\*Applies toward graduation requirements of:** 1 Career Technical Education credit



**Environmental Studies**

**Credits 1/2**

**11, 12**

---

**Course Name**

**Semester 1 and/or 2**

**Grade Level**

**Course Description:** Environmental Studies is a one or two-semester course in which students examine the complex ecological, sociological and political problems created by human interaction with the Earth's environment. Major topics of water and land sustainability are focused on throughout the year. Students will take field trips to view environmental issues around our community as well as work in the greenhouse on a semester and/or year-long project addressing sustainable agriculture.

**Essential Requirements:**

- Demonstrate basic writing and reading skills
- Demonstrate an ability to follow written and verbal instructions
- Demonstrate an ability to work well in small groups with peers frequently
- Demonstrate an ability to perform basic computer skills
- Understand contemporary environmental issues

In the event of over enrollment **first criteria** for consideration shall be current daily attendance.

**ONE – HOUR CLASS**

**CLASS MEETS IN P.M. ONLY**

**Prerequisite Courses:** Biology and Earth Science

**Applies toward graduation requirements of:** 1 Career Technical Education credit

<b>Web Page 1</b>	<b>Credits 1/2</b>	<b>11, 12</b>
<b>Course Name</b>	<b>Semester 1 or 2</b>	<b>Grade Level</b>

**Course Description:** Web Page 1 will provide students with the necessary skills to design, create, and maintain functional web pages. The class will cover HTML 5 (Hyper Text Markup Language), CSS3 (Cascading Style Sheets), Adobe Dreamweaver, Adobe Photoshop, and the basic principles of Graphic Design. The class will focus on fundamental methods, standards, and techniques for creating and maintaining basic web pages using HTML5 and CSS3.

**Other key elements to be taught:**

- Use and function of the internet
- Website evaluation based on design and function
- Website structure and effective navigation
- All aspects of design and function are compared to industry standards

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Prerequisite Courses:** None

**Applies toward graduation requirements of:** 1 Career Technical Education credit

<b>Web Page 2</b>	<b>Credits 1/2</b>	<b>11, 12</b>
<b>Course Name</b>	<b>Semester 1 or 2</b>	<b>Grade Level</b>

**Course Description:** This course further explores and develops skills in web design and development. This course will focus on working with clients, as each eligible student will work with a client and a real world job environment. An emphasis will be placed on the “full package” design and build from domain name to the final upload. Students will work together for art direction and evaluation to create a quality of design that mirrors the industry.

**Other key elements to be taught:**

- Skills, such as interview and responding to feed back
- Web design geared towards the client
- Re-design and modification based on client specifications
- Design solutions including web site, domain names, hosting and email

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Prerequisite Courses:** Requires a grade of “C” or higher in Web Page 1 or administrative approval

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**College Introduction to Web  
Design and Programming**

**Credits 1/2  
3 Credits @ City College-MSU-B**

**11, 12**

---

**Course Name**

**Semester 1 or 2**

**Grade Level**

**Course Description:** College Introduction to Web Design and Programming will provide students with the necessary skills to design, create, and maintain functional web pages. The class will cover HTML 5 (Hyper Text Markup Language), CSS3 (Cascading Style Sheets), Adobe Dreamweaver, Adobe Photoshop and the basic principles of Graphic Design. The class will focus on fundamental methods, standards, and techniques for creating and maintaining basic web pages using HTML5 and CSS3.

**Other key elements to be taught:**

- Use and function of the internet
- Website evaluation based on design and function
- Website structure and effective navigation
- All aspects of design and function are compared to industry standards

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Prerequisite Courses:** None

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Animation Lab 1** **Credits 1/2** **11, 12**

**Course Name** **Semester 1 or 2** **Grade Level**

**Course Description:** This exciting course introduces students to the world of animation, moving from traditional methods and terminology (including anatomy, basic perspective and flipbooks) to cutting edge techniques using Abode Flash software to create and animate 2 dimensional computer based graphics.

There is a strong emphasis placed on drawing, both character and environment.

**Other Key Elements:**

- Flash animation designed and developed specifically for the web
- Use of emerging technology
- Creation of storyboards and outlines
- Creative thinking with technology

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

✓ **Students are assessed a lab fee for materials which must be paid before the third week of class.**

**Prerequisite Courses: Recommend:** Art 1 and basic drawing skills (which should include knowledge of anatomy and perspective)

**Applies toward graduation requirements of:** 1 Career Technical Education credit or 1 Visual/Performing Arts

**Animation Lab II** **Credits 1/2** **11, 12**

**Course Name** **Semester 1 or 2** **Grade Level**

**Course Description:** This course builds on previously learned animation techniques and allows students to take their creativity to the next level in multiple animations. Additionally, students will continue to work on their ability to draw convincing poses, expressions, character designs, thumbnails, and storyboards.

**Other Key Elements:**

- Advanced techniques in Flash, After Effects, and 3D programs
- Use of emerging technology

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

✓ **Students are assessed a lab fee for materials which must be paid before the third week of class.**

**ONE-HOUR CLASS**

**Prerequisite Courses:** Requires a grade of “C” or higher in Animation Lab 1

**Applies toward graduation requirements of:** 1 Career Technical Education credit or 1 Visual/Performing Arts

**Graphics**

**Print Photo**

**Credits 1**

**11, 12**

---

**Course Name**

**Semester 1 or 2**

**Grade Level**

**Course Description:** This course introduces and explores the Graphic Art of Photography. It will also provide students with an introduction to visual concepts, basic image capture, and camera functions using digital cameras. Students will learn to shoot, develop, crop, and mount their photographs as well as specific professional camera and editing techniques. Students will also have the opportunity to begin exploring the cutting edge field of digital photography, using the latest Adobe software available in the industry. This course consists of lecture, textbook assignments as well as darkroom and studio projects. Field trips to local businesses and location shots enhance the hands on learning experience.

**Essential Requirements:**

Students will demonstrate the following:

- Pinhole camera construction and usage
- Basic understanding and use of software basics for photographic imaging and digital printing
- Dry mounting and presentation techniques
- Basic camera functions in DSLR

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Students must have a 'C' or better to move into Digital Photo. Students are assessed a lab fee for materials which must be paid before the third week of class.**

**TWO – HOUR BLOCK:**

**Offered a.m. and p.m.**

**Preferred:** Art 1 or an Art Portfolio

**Applies toward graduation requirements of:** 1 Career Technical Education credit or 1 Visual/Performing Arts

**Design Advertising  
Design Layout**

**Credits 1**

**11, 12**

**Course Name**

**Semester 1 or 2**

**Grade Level**

**Course Description:** This challenging, hands-on course explores the art-related field of Graphic Design, and includes illustration, advertising design & layout; computer assisted design, and design theory. During the semester, students are exposed both to traditional and cutting edge techniques and procedures, and have the opportunity to learn and create in a productive, supportive environment. Additionally, Design students will hear from a variety of professionals working in all aspects of the industry, and will spend time exploring the wide array of graphics related careers available today. Students successfully completing class will be able to step into and perform capably in a number of entry-level jobs in the graphic design industry.

**Essential Requirements:**

Students successfully completing this class will:

- Demonstrate a solid understanding of both the theory and application of the principles and elements of design.
- Demonstrate basic knowledge of typography and composition.
- Demonstrate basic art techniques.
- Demonstrate basic knowledge regarding the history of Graphic Design, including knowledge of a variety of well-know designers and artists.
- Demonstrate introductory knowledge of Adobe Illustrator, the industry's leading design software.

In the event of over **enrollment first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Students must have a "C" or better to move into Digital Illustration or Graphics/Print Photo from Design Advertising/Design Layout or Instructor/Administrator approval. Students are assessed a lab fee for materials which must be paid before the third week of class.**

**TWO – HOUR BLOCK:**

**Offered a.m. and p.m.**

**Prerequisite:** 1 credit of Art (2 art classes) preferred

**Applies toward graduation requirements of:** 1 Career Technical Education credit or 1 Visual/Performing Arts

**Digital Photo**

**Credits 1/2**

**11, 12**

**Course Name**

**Semester 1 or 2**

**Grade Level**

**Course Description:** This course encourages students to further develop the graphic communication and design skills learned in previous classes, and involves practical lessons dealing with image manipulation. In addition, students will be introduced to Cinema using DSLR's. Students will enhance their skills in photography, composition, layout & design, and through the use of Adobe Software's industry standard Creative Suite. In this class, there is major emphasis on not only learning how to use Adobe Photoshop, but also on how to apply that knowledge in building a professional quality portfolio. Occasionally, community design/graphics projects are brought in and completed in-house by the class members.

Students successfully completing this class will be able to step into and perform capably in a number of above entry-level jobs in the Graphic Arts industry.

**Essential Requirements:**

- Students successfully completing this class will:
- Capably demonstrate knowledge and application of all aspects of Adobe Photoshop/Lightroom through class lessons and self-directed work
- Capably demonstrate Photoshop skills through a variety of relevant assignments, including business card and cd cover design, photo retouching, and photo manipulation
- Basics of Cinematography

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

- **It is recommended students who successfully complete this class continue in Design and Layout.**
- **Students are assessed a lab fee for materials, which must be paid before the third week of class.**

**ONE – HOUR CLASS**

**Offered a.m. fall semester and p.m. spring semester**

**Recommended background:** First-year graphics or several art classes

**Prerequisite:** Students must earn a "C" or better in Graphics/Print Photo

**Applies toward graduation requirements of:** 1 Career Technical Education credit or 1 Visual/Performing Arts

**Course Description:** This course encourages students to further develop the graphic communication and design skills learned in previous classes. Students will enhance their skills in composition, layout and design through the use of Adobe Software's industry standard Creative Suite. In this class, there is major emphasis on not only learning *how* to use Adobe Illustrator, but also how to apply that knowledge in building a professional quality portfolio. Occasionally, community design/graphics projects are brought in and completed in-house by class members. Students successfully completing class will be able to step into and perform capably in a number of entry-level jobs in the graphic design industry.

**Essential Requirements:**

Students successfully completing this class will:

- Demonstrate a solid understanding of both the theory and application of the principles and elements of design.
- Demonstrate basic knowledge of typography and composition.
- Demonstrate basic art techniques.
- Demonstrate basic knowledge regarding the history of Digital Design, including knowledge of a variety of well-known designers and artists.
- Demonstrate knowledge of Adobe Illustrator, the industry's leading design software, including: tool usage, and intermediate skill.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

- **It is recommended that students who successfully complete this class and have also completed Graphics/Print Photo continue with Digital Photo.**
- **Students are assessed a lab fee for materials, which must be paid before the third week of class.**

**ONE – HOUR CLASS**

**Offered p.m. Fall Semester, and a.m. Spring Semester**

**Prerequisite:** Students must earn a "C" or better in Design Advertising/Design Layout

**Applies toward graduation requirements of:** 1 Career Technical Education credit or 1 Visual/Performing Arts



**Exploring Visual Media**

**Credit 1/2**

**10, 11, 12**

---

**Course Name**

**Semester 1 or 2**

**Grade Level**

**Course Description:** Exploring Visual Media opens the pathway to an exciting world of graphics-related technology and career options.

Interested students will engage in an intensive, semester long tour through the fields of visually-related media.

Additionally, students taking **Exploring Visual Media** will have the opportunity to learn about visually related career options in a variety of ways, including field trips, guest speakers, video presentations, and traditional, pen/paper based research.

Students leaving the class will be well-equipped to continue their exploration in any of the Career Center's other graphics based offerings.

**Essential Requirements:**

- Students will explore the following graphics-linked disciplines:
  - Graphic Design: Students will learn the basics of graphic design, including composition, color theory, typography and the principles of design. Students will create a variety of work based upon the information they learn.
  - Photography: Students will learn the principles of photography and will learn how to build their very own working pinhole cameras. They will develop their own film and print their own pictures before moving on to cutting-edge, digitally based photography.
  - Animation: Students will explore the history of animation, as well as the principles behind it. They will create their own paper-based animations and be briefly introduced to the Adobe's "Animate" software.
  - Web Design: During this brief introduction to the world of web design, students will learn about the principles necessary to designing an effective webpage, and will take a look at "coding" the most effective way of creating web-based content.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE - HOUR CLASS**

Students are assessed a lab fee for materials which must be paid before the third week of class.

**Prerequisite Courses: None**

**Applies toward graduation requirements of:** 1 Career Technical Education credit or 1 Visual/Performing Arts



**College Algebra (Math 121)**

Course Name	Semester 1	Grade Level
-------------	------------	-------------

**Course Description:** College Algebra is a rigorous course that analyzes and interprets the behavior and nature of functions including linear, quadratic, polynomial, rational, exponential, logarithmic, power, absolute value, and piecewise-defined functions. Additional topics include systems of equations, matrices, and making decisions using probability. This course qualifies for Dual Enrollment Credit through Montana State University-Billings. Students must pass entrance requirements and pay course fees for MATH 121.

**Prerequisite:** Algebra 2 and qualifying test score of a 22+ on the ACT Math Test or the Accuplacer Exam.

**Applies toward graduation requirements of:** 2 Math credits

College	Credits 1/2	
Technical Math	3 Credits @ City College-MSU-B	11, 12

Course Name	Semester 1 or 2	Grade Level
-------------	-----------------	-------------

**Course Description:** Applies math to problems drawn from diverse occupational fields. In addition to a review of operations on rational numbers, the topics of measurement, percent, proportion and variation, applications of algebra to the extent of solving quadratic equations, and applications of plane and solid figure geometry are developed for use in a trade of industrial setting. Course may serve as a prerequisite to M 114, but does not satisfy the prerequisite of any other math courses. Credits apply to graduation but do not fulfill General Education requirements. City College-MSU-B credit (3 credits) may be awarded with proficiency and a passing grade in the course or the student may have to demonstrate proficiency in the course and pass a written comprehensive exam. Please contact the Career Center Counselor for a clarification of the information.

In the event of over enrollment **first criteria** for considerations shall be current daily attendance. Attendance is required and documented.

**Prerequisite Course:** Completion of Geometry/Acceptable score on the Accuplacer Exam and/or ACT/SAT Exams.

**Applies toward graduation requirements of:** 7 Elective credits

College Extended  
Technical Math

Credits 1/2  
3 Credits @ City College-MSU-B

11, 12

---

Course Name

Semester 1 or 2

Grade Level

**Course Description:** This course applies math to problems drawn from diverse occupational fields. The course provides for the study of measurement, algebra, geometry, and trigonometry as needed to solve mathematical applications in a trade or technical work environment. Technical Math is a course designed for students who are considering going into a vocational or technical career. This class is a mixture of math skills from a variety of mathematical principles that focus strongly on the application of these skills to solve problems drawn from diverse occupational fields. The majority of the class time will be spent on integrating a variety of technical terms and tools to solve mathematically related problems that are common to real life workplace situations. An example of what a problem in this course may look like is: Find how many horsepower a motor would receive if it is 80% efficient with a 6.20 horsepower output.

City College-MSU-B credit (3 credits) may be awarded with proficiency and a passing grade in the course or the student may have to demonstrate proficiency in the course and pass a written comprehensive exam. Please contact the Career Center Counselor for a clarification of the information. M114 Extended Technical Math is a 3 credit class that is required for many City College MSU-B Associate of Applied Science degrees.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Prerequisite Course:** Completion of Geometry/Acceptable score on the Accuplacer Exam and/or ACT/SAT Exams.

**Applies toward graduation requirements of:** 2 Mathematics credits or 7 Elective credits.

College Math  
For Healthcare

Credits 1/2  
3 Credits @ City College-MSU-B

11, 12

Course Name

Semester 1 or 2

Grade Level

**Course Description:**

Provides students with a solid mathematical foundation necessary to succeed in a healthcare profession. This course will review algebra, systems of measurement, ratio and proportions, basic probability and statistics concepts, and ionic solutions and pH calculations. This course will apply mathematical reasoning and problem solving as it applies to the healthcare field and is a suitable prerequisite for STAT216. The main goal of College Math for Healthcare is to develop critical thinking and problem solving skills that will enable students to quantitatively analyze and solve problems drawn from the field of healthcare. Upon successful completion of the course, students should be able to:

- Apply knowledge of decimals, fractions, and percents to solve algebraic linear equations in the healthcare field.
- Understand rational equations and use knowledge of rational equations to solve problems involving ratios and proportions including but not limited to volume, mass, weight, and temperature.
- Be able to use the fundamental units of the metric system (SI), household units, and the apothecary system in making measurements and doing calculations related to allied health applications.
- Interpret the meaning of range, standard deviation, and the coefficient of variation in applied situations.
- Use and apply the basic probability concepts: probability models (Venn diagrams, two-way tables), sample spaces with equally likely outcomes (counting), probability distributions.
- Use and apply the rudiments of statistics: measures of center and spread, the normal distribution.
- Understand and interpret exponential and logarithmic functions and graphs.
- Apply knowledge of logarithmic functions to solve problems in the healthcare.
- Apply mathematical and statistical reasoning to a variety of applied or theoretical healthcare problems.

City College-MSU-B credit (3 credits) may be awarded with proficiency and passing grade in the course or the student may have to demonstrate proficiency in the course and pass a written comprehensive exam. Please contact the Career Center Counselor for a clarification of the information. M140 College Math for Healthcare is a 3 credit class that is required for many City College MSU-B Associate Medical degrees.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Prerequisite Course:** Completion of Geometry/Acceptable score on the Accuplacer Exam and/or ACT/SAT Exams.

**Applies toward graduation requirements of:** 2 Mathematics credits of 7 Elective credits.

English 4 Tech Writing	Credits 1 3 Credits @ City College-MSU-B	12
<b>Course Name</b>	<b>Semester 1 &amp; 2</b>	<b>Grade Level</b>

**Course Description:** This course covers the Billings Public Schools English 4 curriculum/essential requirements and introduces the student to the creation and evaluation of several kinds of written and oral technical communication. It is a dual enrollment course worth three credits and is the equivalent to WRIT 121 offered at City College at MSU-Billings.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Prerequisite Course:** Successful Completion of English 3  
Qualifying score on either the Accuplacer or the ACT

**Applies toward graduation requirements of:** 4 English credits

College Writing/English 4	Credits 1 3 Credits @ City College/MSU-B and MSU-B	12
<b>Course Name</b>	<b>Semester 1 &amp; 2</b>	<b>Grade Level</b>

**Course Description:** This course covers the Billings Public Schools English 4 curriculum and integrates and provides instruction in writing competencies expected of college students. It pays special attention to writing as a problem-solving process, patterns of organization in personal and informative writing, and logical thinking and style in argumentative/persuasive writing. Students are immersed in the writer's workshop classroom model through writing and responding to writing (their own and from other authors) on a daily basis. It is the equivalent to Writing 101 which is offered at City College at MSU-Billings and MSU-Billings. This is a concurrent enrollment course and students will be required to test into it in order to receive college credit. Other requirements may apply. Please contact your counselor for additional information.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**City College/MSU Billings and MSU Billings:** 3 credits in WRIT 101 will be issued to students who pass the College Writing/English 4 class and complete all WRIT 101 competencies.

**Prerequisite Course:** Successful completion of English 3  
Qualifying score on either the Accuplacer or the ACT

**Applies toward graduation requirements of:** 4 English credits

<b>College Writing 104</b>	<b>Credits 1/2</b>	
<b>Workplace Communications</b>	<b>3 Credits @ City College-MSU-B</b>	<b>12</b>
<b>Course Name</b>	<b>Semester 1 &amp; 2</b>	<b>Grade Level</b>

**Course Description:** Designed to teach students the fundamentals of the English language, including grammar, spelling, punctuation, and word usage, with emphasis on applying these skills in written communication for the work world. City College-MSU-B credit (3 credits) may be awarded with proficiency and a passing grade in the course or the student may have to demonstrate proficiency in the course and pass a written comprehensive exam. Please contact the Career Center Counselor for a clarification of the information.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Prerequisite Course:** Acceptable score on the Compass exam and/or ACT/SAT exams.

**Applies toward graduation requirements of:** 7 Elective credits

<b>College COMX 106</b>	<b>Credits 1/2</b>	
<b>Communicating in a Dynamic Workplace</b>	<b>3 Credits @ City College-MSU-B</b>	<b>11, 12</b>
<b>Course Name</b>	<b>Semester 1 or 2</b>	<b>Grade Level</b>

**Course Description:** Offers a theoretical and practical understanding of communication processes in the working environment, self-awareness in that environment, and the individual's participation in these relationships. The course aims to develop the student's perception and expression skill to communicate successfully in a variety of work contexts. City College and MSU-B credit (3 credits) may be awarded with proficiency and a passing grade in the course of the student may have to demonstrate proficiency in the course and pass a written comprehensive exam. Please contact the Career Center Counselor for a clarification of the information.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Prerequisite Course:** None

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Course Description:** Advanced Placement® Psychology is a one semester collegiate level survey which will introduce students to psychological objectives, content, and methodologies. The goal of this course is to give students a useful understanding of that content, along with evidentiary understandings of treatments, neuropsychological contributions to the field, and psychology as a science. This course will include extensive readings from an AP® recognized college level text along with an assortment of other scholarly readings, most of which are noted in the course syllabus. Students will have the opportunity to earn college credit through the Advanced Placement examination process.

**This course will address the following areas of study:**

- History and Approaches
- Research Methodology
- Neuropsychology: Biological Basis of Behavior
- Sensation and Perception
- States of Consciousness
- Learning
- Cognition and Memory
- Motivation and Emotion
- Developmental Psychology
- Personality
- Testing and Individual Differences
- Abnormal Psychology and Treatment
- Social Psychology

**Prerequisite Courses:** There are no specific prerequisite courses that are required for enrollment in AP® Psychology. Nonetheless, students enrolling in this course should be prepared for challenging readings, assignments, and exams.

**Applies toward graduation requirements of:** 1/2 Social Studies credit



**Course Description:** This class is designed to provide students with the analytical skills and factual knowledge necessary to deal critically with the problems and materials in United States history. The program prepares students for intermediate and advanced college courses by making demands upon them equivalent to those made by full-year introductory college courses. Students will learn to assess historical materials, their relevance to a given interpretive problem, their reliability and their importance, and interpretations presented in historical scholarship. Students will develop the skills necessary to arrive at conclusions on the basis of an informed judgment and to present reasons and evidence clearly and persuasively in an essay format.

**Topics:**

- Indigenous peoples
- Political, economic, and cultural heritage
- The Revolution
- The creation of the Constitution
- The Jacksonian period and increasing democracy
- Economics
- Sectionalism, slavery, war, and Reconstruction
- The ramifications of World War One
- The 1920's
- The Depression and the New Deal
- The Cold War, the 1960's and their aftermath

**Prerequisite Courses:** None

**Applies toward graduation requirements of:** 1 United States History credit

<b>Technical Geometry Geometry in Construction</b>	<b>Credits 1 (1/2 Math - 1/2 Career Technical Education each semester)</b>	<b>9, 10, 11, 12</b>
--	--	----------------------

---

<b>Course Name</b>	<b>Semester 1 &amp; 2 (Full Year Course)</b>	<b>Grade Level</b>
--------------------	--	--------------------

**Course Description:** This course is designed to show the relevance of Geometry through a variety of practical applications related to but not limited to the construction industries. Students will be: participating in hand-on activities, working in a classroom & shop setting, participating in the construction of a house, and investigating business components in construction and related industries. Students who are interested in architecture, interior design, engineering, construction management, drafting, building trades (electrical, plumbing, etc.) as well as all aspects of manufacturing would benefit from this course. The objectives of this course are to promote academic rigor and real world relevance by having students solve multi-step problems, engage in math concepts that appear in different phases of construction and work in a team setting.

**Essential Requirements:**

- Students will participate in all aspects of safety, related to construction and manufacturing industries.
- Students will work in shop and construction site environments.
- Students will successfully complete the Geometry requirements as indicated in the All Billings Curriculum.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**TWO – HOUR BLOCK / YEAR LONG CLASS**  
**FALL ENROLLMENT ONLY**

**Prerequisite Courses:** Algebra 1 with a “C” grade or better

**Applies toward graduation requirements of:** 2 Math credits and 1 Career Technical Education credit

**Construction Fundamentals 1****Carpentry 1****Credits 1 1/2****Construction Technique 1****First Year - Semester 1****11, 12****Course Name****Semester 1 & 2 (Full Year Course)****Grade Level**

**Course Description:** First year house construction students will work hands-on in the construction of this year's student built house. Students will develop skills and valuable construction knowledge in the first phases of the building construction trades. Students will learn the dynamics of a real residential house construction site. Students will receive on the job training as they learn the trades and experience the work ethics of residential construction.

**Essential Requirements:**

- Students will complete: framing, concrete finishing, Western balloon framing, roofing, heating and cooling (mechanical work), wiring, insulation, drywall hanging, drywall perfataping.
- Ability to work safely, independently and without constant supervision.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**THREE – HOUR BLOCK - NO EXCEPTIONS!****Prerequisite Courses:** None**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Construction Fundamentals 2****Carpentry 2****Credits 1 1/2****Construction Technique 2****First Year - Semester 2****11, 12****Course Name****Semester 1 & 2 (Full Year Course)****Grade Level**

**Course Description:** First year house construction students will continue to work hands-on in the construction of this year's student built house. Students will develop skills and valuable construction knowledge in the remaining phases of the building construction trades. Students will learn the dynamics of a real residential house construction site. Students will receive on the job training as they learn the trades and experience the work ethics of residential construction.

**Essential Requirements:**

- Students will complete: drywall, perfataping, painting, trim, carpentry, cabinet installation, floor covering, cultured stone applications, finish plumbing, concrete framing, deck construction, detailing out a house

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**THREE – HOUR BLOCK - NO EXCEPTIONS!**

**Prerequisite Courses:** Construction Fundamentals 1, Carpentry 1, Construction Technique 1 with a grade of “C” or better, or consent of instructor with recommendation of administrator/counselor.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

<b>Building Trades 1</b>	<b>Credits 1 1/2</b>	
<b>House Building 1</b>	<b>Second Year - Semester 1</b>	<b>12</b>
<b>Construction Technique 3</b>		
<b>Course Name</b>	<b>Semester 1 &amp; 2 (Full Year Course)</b>	<b>Grade Level</b>

**Course Description:** Second year house construction students will work with first year students to complete this year’s student built house. The second year student will serve as a leader to demonstrate good work ethics and help guide first year students through the building construction trades. Second year students will expand their knowledge and refine their skills as they work to complete a second house. The second year student should achieve greater proficiency in their work and the development of their skills.

**Essential Requirements:**

- Students will complete: framing, concrete finishing, Western balloon framing, roofing, heating and cooling (mechanical work), wiring, insulation, drywall hanging, drywall perfataping.
- Ability to work safely, independently and without constant supervision.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**THREE – HOUR BLOCK FOR 2<sup>ND</sup> YEAR STUDENTS – NO EXCEPTIONS!**

**Prerequisite Courses:** Successful completion of one semester of Construction Fundamentals 1, Carpentry 1, Construction Technique 1, or Construction Fundamentals 2, Carpentry 2, Construction Technique 2 with a “C” grade or better or consent of instructor with recommendation of counselor/administrator.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

<b>Building Trades 2</b>	<b>Credits 1 1/2</b>	
<b>House Building 2</b>	<b>Second Year - Semester 2</b>	<b>12</b>
<b>Construction Technique 4</b>		
<b>Course Name</b>	<b>Semester 1 &amp; 2 (Full Year Course)</b>	<b>Grade Level</b>

**Course Description:** Second year house construction students will receive the hands-on training that comes with working through the last phases of house construction. Second year students will experience the challenges of house construction with a greater level of understanding. Students will benefit from the development of skills with a higher proficiency and the diverse knowledge that comes with two years of training. Students will enter the job market with confidence and success.

**Essential Requirements:**

- Students will complete: drywall perfataping, painting, trim carpentry, cabinet installation, floorcoverings, cultured stone applications, finish plumbing, concrete framing, deck construction, detailing out a house.
- Ability to work safely, independently and without constant supervision.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**THREE – HOUR BLOCK FOR 2ND YEAR STUDENTS - NO EXCEPTIONS!**

**Prerequisite Courses:** Successful completion of Building Trades 1, House Building 1, Construction Technique 3 with a grade of “C” or better or consent of instructor with recommendation of counselor/administrator.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

<b>Café Protégé</b>	<b>Credits 2 (1 credit per semester)</b>	<b>11, 12</b>
<b>Course Name</b>	<b>Semester 1 &amp; 2 (Full Year Course)</b>	<b>Grade Level</b>

**Course Description:** Café Protégé is a **year-long class**. The course introduces students to commercial foodservice concepts not found in more traditional F.A.C.S. programs. Classes are held off campus at City College-Montana State University Billings and are held in two-hour blocks. In addition to the fun of food preparation, topics such as customer relations, accounting, food cost controls, and marketing are covered.

Students are strongly urged to work in a paid internship at local food service establishments, if they choose to receive certification from the National Restaurant Association Education Foundation. Students can receive dual credit (both high school graduation credit and college credit) at most major culinary schools.

In addition to internships, students will also participate in School District catering projects and local benefits which include menu planning, purchasing, preparation, set up, service and clean up.

**Fees Charged:** Each semester a lab fee is required. Chef's coats will be provided.

**Essential Requirements:**

- Preparing for successful careers in the foodservice industry
- Understanding successful customer relations
- Preventing accidents in the workplace
- Demonstrating proper food preparation techniques by planning, preparing and serving foods
- Exploring workplace communication, time management, and personnel management

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**TWO – HOUR BLOCK / YEAR LONG CLASS**

**Prerequisite Courses:** Priority is given to students with prior culinary coursework.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Home Design/  
Interior Design**

**Credit 1**

**11,12**

---

**Course Name**

**Semester 1**

**Grade Level**

**Course Description:** This course is designed to provide skills with a hands-on approach to learning. Highlights include exterior house design, kitchen design, principals and elements of design, selection of wallpaper, paint, lighting, flooring, tile, faux finishes, and fabrics to be used in the student built house. The class is designed to meet the needs of students who are post secondary bound as well as providing students with the skills needed to decorate their own personal living environment.

**Essential Requirements:**

- Apply principles and elements of design to create an interior design plan for a student built house.
- Evaluate various housing products based on a specific design need.
- Communicate design ideas through visual and oral presentation.
- Work in cooperative groups to implement a design plan for the Career Center student built house.
- Explore career options within the design field.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**TWO – HOUR BLOCK**  
**1<sup>ST</sup> SEMESTER ONLY**

**Prerequisite Courses:** Priority will be given to students with prior related coursework.

**Applies toward graduation requirements of:** 1 Career Technical Education credit



**Home Improvement  
Design Improvement**

**Credit 1**

**11, 12**

---

**Course Name**

**Semester 2**

**Grade Level**

**Course Description:** This course is designed to provide students with the essential skills and knowledge needed to make basic home improvements and repairs through a hands-on approach to learning. Highlights include wallpaper installation, faux painting, stenciling, basic wall repair, mudding/taping sheetrock, basic sewing and upholstery skills. Students will become familiar with several different power tools. This class will teach basic skills necessary to maintain and enhance a home.

**Essential Requirements:**

- Communicate design ideas through visual presentation
- Calculate quantities, measure, order, and install wallpaper
- Develop skills needed to complete stenciling, faux finishing, and mudding/taping sheetrock
- Analyze career options available in the Home Improvement industry
- Basic understanding of textiles

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**TWO – HOUR BLOCK**  
**2<sup>ND</sup> SEMESTER ONLY**

**Prerequisite Courses:** Priority will be given to students with prior related coursework.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**College Introduction to  
Interior Design**

**Credit 1  
3 Credits at Gallatin College**

**11, 12**

---

**Course Name**

**Semester 1 & 2 (Full Year Course)**

**Grade Level**

**Course Description:** This class is designed to provide dual credit with Gallatin College. Students successfully completing Interior/Home Design and Home/Design Improvement with 90% and above will receive college credit for IDSN101 Intro to Interior Design at Gallatin College in Bozeman. They will be given the opportunity to tour campus and meet instructors prior to enrollment. The objective of this course is to provide a successful transition from high school to post-secondary education.

**Essential Requirements:**

- Extended course work utilizing Gallatin's college text
- Interview with instructor prior to completion of course

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**PART OF A TWO-HOUR BLOCK**

- to be taken with Home Design - Semester 1 **AND**
- to be taken with Home Improvement - Semester 2

**Prerequisite Courses:** Priority will be given to students with prior related coursework.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Manufacturing Processing 1  
Manufacturing Design 1**

**Credit 1**

**11, 12**

**Course Name**

**Semester 1 or 2 - 1<sup>st</sup> Year Student**

**Grade Level**

**Course Description:** This course offers students the opportunity to learn and explore the many aspects of metals manufacturing. Students will explore a variety of welding processes through hands on interaction in the welding lab. These processes may include: oxygen-acetylene welding and cutting, plasma cutting, shielded metal arc welding, and gas metal arc welding. It is our goal to explore as many manufacturing processes as possible to prepare students for a career in metals manufacturing.

**Essential Requirements:**

- Ability to work safely in a shop environment
- Ability to work in groups with peers
- Ability to work independently to complete given assignments

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Must maintain a grade of “C” or better to move into 2<sup>nd</sup> semester classes**

**TWO – HOUR BLOCK**

**Prerequisite Courses:** Basic Math skills

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Manufacturing Processing 2**  
**Manufacturing Design 2**

**Credit 1**

**11, 12**

---

**Course Name**

**Semester 1 or 2 - 1<sup>st</sup> Year Student**

**Grade Level**

**Course Description:** This exciting course offers students the opportunity to continue learning and exploring the many aspects of metals manufacturing. Students will explore a variety of advanced welding techniques through hands on interaction in the welding lab. Students will be exposed to out of position welding using the shielded metal arc and gas metal arc welding processes. It is our goal to explore as many manufacturing processes as possible to prepare students for a career in metals manufacturing.

**Essential Requirements:**

- Ability to work safely in a shop environment
- Ability to work in groups with peers
- Ability to work independently to complete given assignments

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Must maintain a grade of “C” or better to move into 3<sup>rd</sup> semester classes**

**TWO – HOUR BLOCK**

**Prerequisite Courses:** Must have completed Manufacturing Process 1 & Manufacturing Design 1 with a grade of “C” or better or instructor / administrator approval.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Manufacturing Technology 1  
Manufacturing System 1**

**Credit 1**

**12**

**Course Name**

**Semester 1 or 2 – 2nd Year Student**

**Grade Level**

**Course Description:** This exciting course offers students the opportunity to apply the skills learned in Manufacturing Process and Design. Along with learning stick, MIG, and TIG welding, students will learn basic blueprint reading, layout techniques, and measurement skills. Students will be given the opportunity to design and build personal projects of their choosing.

**Essential Requirements:**

- Ability to work safely in a shop environment
- Ability to work in groups with peers
- Ability to work independently to complete given assignments

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Must maintain a grade of “C” or better to move into 4<sup>th</sup> semester classes**

**TWO – HOUR BLOCK**

**Prerequisite Courses:** Must have completed: Manuf. Process1 and Manuf. Design 1, Manuf. Process 2 and Manuf. Design 2 with a grade of “C” or better or instructor/administrator approval.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Manufacturing Technology 2  
Manufacturing System 2**

**Credit 1**

**12**

**Course Name**

**Semester 1 or 2 – 2nd Year Student**

**Grade Level**

**Course Description:** This course allows students to apply their metal working skills to advanced manufacturing applications such as pipe welding, build to print manufacturing, automated plasma cutting, and metal working design.

**Essential Requirements:**

- Ability to work safely in a shop environment
- Ability to work in groups with peers
- Ability to work independently to complete given assignments
- Blue print reading
- Basic Math
- Basic Measuring Skills

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Must have maintained a grade of “C” or better in the 1<sup>st</sup> three semesters of the program.**

**TWO – HOUR BLOCK**

**Prerequisite Courses:** Must have completed Manuf. Process 1 and Manuf. Design 1, Manuf. Process 2 and Manuf. Design 2, Manuf. Tech 1 and Manuf. System 1 with a grade of “C” or better or by instructor/administrator approval.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

College Welding 125	Credit 1 5 Credits @City College-MSU-B	12
Course Name	Semester 1	Grade Level

**Course Description:** Student learning includes manual and semi-automated oxy-acetylene cutting processes and safety. Shielded Metal Arc Welding with 6010 electrode, which leads toward American Welding Society D1.1 and American Society of Mechanical Engineers Section IX structural certification. Learning the air carbon arc cutting, plasma arc cutting processes, and equipment set-up. Welding shop safety and quality are emphasized.

**Essential Requirements:**

- Ability to work safely in a shop environment
- Ability to work in groups with peers
- Ability to work independently to complete given assignments
- Blueprint reading
- Basic Math
- Basic Measuring Skills

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Must have maintained a grade of “C” or better in the 1<sup>st</sup> two semesters of the program.**

**TWO – HOUR BLOCK**

**Prerequisite Courses:** Must have completed Manuf. Process 1 and Manuf. Design 1, Manuf. Process 2 and Manuf. Design 2 with a grade of “C” or better or by instructor/administrator approval

**Applies toward graduation requirements of:** 1 Career Technical Education credit

College Welding 157	Credit 1 5 Credits @City College-MSU-B	12
Course Name	Semester 2	Grade Level

**Course Description:** Introduction of semi-automatic wire feed processes. This course leads to AWS and ASME qualification of plate (all positions) with the SMAW, GMAW, and FCAW processes. Safe practices and weld quality are major considerations.

**Essential Requirements:**

- Ability to work safely in a shop environment
- Ability to work in groups with peers
- Ability to work independently to complete given assignments
- Blueprint reading
- Basic Math
- Basic Measuring Skills

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**Must have maintained a grade of “C” or better in the 1<sup>st</sup> three semesters of the program.**

**TWO – HOUR BLOCK**

**Prerequisite Courses:** Must have completed Manuf. Process 1 and Manuf. Design 1, Manuf. Process 2, Manuf. Design 2, Manuf. Tech 1, Manuf. System 1 or College Welding 125 with a grade of “C” or better or with instructor/administrator approval

**Applies toward graduation requirements of:** 1 Career Technical Education credit



**Course Description:** This course explores and develops skills in basic machining technology as it applies to modern machining. It combines the applied technology of machining on lathes, mills, and drill presses. Students will complete a series of projects which will teach them skill sets which include: precision measurement using micrometers and calipers, threading, tapping, tapering, knurling, and traditional operation of the lathes, mills and drill presses. Students will have the ability to manufacture precision parts and produce quality projects upon completion of class.

**Essential Requirements:**

- Ability to follow written and verbal instructions
- Ability to understand and implement safety aspects of machining technology
- Ability to work safely with industrial equipment
- Ability to use basic math and precision measuring techniques
- Ability to perform basic machining tasks on lathes and mills
- Ability to work in groups with peers
- Ability to work independently and complete tasks in appropriate time allotted

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Prerequisite Courses:** None. Of the machining classes offered it is recommended that this course be taken first.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**CNC Machining Technology**

**Credit 1/2**

**11, 12**

---

**Course Name**

**Semester 1 or 2**

**Grade Level**

**Course Description:** This course will introduce students to the world of Computer Numerically Controlled Machining and Cutting. Students will learn the basic concepts of 3D drafting and solid modeling then learn to convert their designs into actual parts by utilizing our industry proven CNC Mill and plasma cutter. Students will leave this class with a basic foundation necessary for the manufacturing of precision components.

**Essential Requirements:**

- Basic Computer Skills
- Ability to work safely in a shop environment
- Ability to work in groups with peers
- Ability to work independently to complete given assignments

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Prerequisite Courses:** Machinist Technology (Manual) is recommended first, but not required, before taking CNC Machining Technology.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**CNC Machining  
Technology & Design**

**Credit 1/2**

**11, 12**

---

**Course Name**

**Semester 1 or 2**

**Grade Level**

**Course Description:** This course explores advanced applications of Computer Numerically Controlled machining through the use of Computer Aided Design (CAD) in conjunction with Computer Aided Manufacturing (CAM). Students will have the opportunity to learn advanced skills in precision measuring, use of digital readouts, drawing with basic CAD, and basic machine programming. These skills will be combined to program CNC lathes, mills, and plasma tables to machine precision parts during class.

**Essential Requirements:**

- Ability to follow written and verbal instructions
- Ability to understand and implement safety aspects of machining technology
- Ability to work safely with industrial equipment
- Ability to use basic math and precision measuring techniques
- Ability to perform basic machining tasks on lathes and mills
- Ability to work in groups with peers
- Ability to work independently and complete tasks in appropriate time allotted

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Prerequisite Courses:** Completion of the following with a grade of “C” or better- Machinist Tech. (manual), CNC Machining Tech. and / or recommendation of instructor/administrator

**Applies toward graduation requirements of:** 1 Career Technical Education credit

+ Construction Fundamentals 1  
+ Carpentry 1  
+ Construction Techniques 1

Credit 1 1/2

11, 12

---

Course Name

Semester 1 – 1st Year Student

Grade Level

**Course Description:** Construction Fundamentals is an in-shop experience, in that the course is designed to teach all safety and tool operation, as well as give the students as many experiences in dealing with the construction trades as possible. This is a progressive type program, as skill levels increase, so will the tasks required of each student. As students learn and gain the confidence needed to be successful they will be exposed to a multitude and varying array of construction trades techniques.

**Essential Requirements:**

- Ability to follow instruction, written and verbal.
- Work safely with industrial equipment
- Ability to understand safety aspects
- Basic plumbing/wiring
- Measuring, basic math skills
- Ability to take notes and do small scale drawings

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**FIRST YEAR**

**THREE - HOUR BLOCK**

**CLASS OFFERED PERIODS 1, 2, & 3 ONLY**

**Prerequisite Courses-** Strong math background and ability to work appropriately and safely with equipment

**Applies toward graduation requirements of:** 1 Career Technical Education credit

+ Construction Fundamentals 2

+ Carpentry 2

+ Construction Techniques 2

Credit 1 1/2

11, 12

---

Course Name

Semester 2 – 1<sup>st</sup> Year Student

Grade Level

**Course Description:** Construction Fundamentals is an in-shop experience, in that the course is designed to teach all safety and tool operation, as well as give the students as many experiences in dealing with the construction trades as possible. This is a progressive type program, as skill levels increase, so will the tasks required of each student. As students learn and gain the confidence needed to be successful they will be exposed to a multitude and varying array of construction trades techniques.

**Essential Requirements:**

- Ability to follow instruction, written and verbal
- Work safely with industrial equipment
- Ability to understand safety aspects
- Basic blueprint reading
- Measuring, basic math skills
- Basic wiring/plumbing techniques
- Ability to take notes and do small scale drawings
- Safety is a number one priority for participation in this course. An IEP review will take place if safety for all stakeholders is a concern
- Sheetrock/perfataping/texturing applications
- Ability to work safely, independently and without constant supervision

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**FIRST YEAR**

**THREE-HOUR BLOCK**

**CLASS OFFERED PERIODS 1, 2, & 3 ONLY**

**Prerequisite Courses:** Strong math background and ability to work appropriately and safely with equipment. +Construction Fundamentals 1, +Carpentry 1, +Construction Tech. 1, successfully completed. Counselor, instructor/administrator approval

**Applies toward graduation requirements of:** 1 Career Technical Education credit

+ Building Trades 1		
+ House Building 1		
+ Construction Techniques 3	Credit 1 1/2	12
<b>Course Name</b>	<b>Semester 1 -2<sup>nd</sup> Year Student</b>	<b>Grade Level</b>

**Course Description:** Building Trades is an in-shop experience, in that the course is designed to teach all safety and tool operation, as well as give the students as many experiences in dealing with the construction trades as possible. This is a progressive type program, as skill levels increase, so will the tasks required of each student. As students learn and gain the confidence needed to be successful they will be exposed to a multitude and varying array of construction trades techniques.

**Essential Requirements:**

- Ability to follow instruction, written and verbal
- Work safely with industrial equipment
- Ability to understand safety aspects
- Basic blueprint reading
- Measuring, basic math skills
- Basic wiring/plumbing techniques
- Ability to take notes and do small scale drawings
- Sheetrock/perfataping/texturing applications

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**SECOND YEAR**

**THREE-HOUR BLOCK**

**CLASS OFFERED PERIODS 1, 2, & 3 ONLY**

**Prerequisite Courses:** Strong math background and ability to work appropriately and safely with equipment. Satisfactory completion of both semesters of: +Const. Fundamentals 1 & 2, +Carpentry 1 & 2, +Construction Techniques 1 & 2 or Instructor/Administrative approval.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

+ Building Trades 2	Credit 1 1/2	12
+ House Building 2		
+ Construction Techniques 4		
<b>Course Name</b>	<b>Semester 1 -2<sup>nd</sup> Year Student</b>	<b>Grade Level</b>

**Course Description:** Building Trades is an in-shop experience, in that the course is designed to teach all safety and tool operation, as well as give the students as many experiences in dealing with the construction trades as possible. This is a progressive type program, as skill levels increase, so will the tasks required of each student. As students learn and gain the confidence needs to be successful they will be exposed to a multitude and varying array of construction trade techniques.

**Essential Requirements:**

- Ability to follow instruction, written and verbal
- Work safely with industrial equipment
- Ability to understand safety aspects
- Basic blueprint reading
- Measuring, basic math skills
- Basic wiring/plumbing techniques
- Ability to take notes and do small scale drawings
- Safety is a number one priority for participation in this course. An IEP review will take place if safety for all stakeholders is a concern
- Sheetrock/perfataping/texturing applications
- Ability to work safely, independently and without constant supervision

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**SECOND YEAR**

**THREE-HOUR BLOCK**

**CLASS OFFERED PERIODS 1, 2, & 3 ONLY**

**Prerequisite Courses:** Strong math background and ability to work appropriately and safely with equipment. +Building Trades 1, + House Building 1, +Construction Techniques 3 successfully completed and /or counselor instructor/administrative approval.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Auto Care**

**Credit 1/2**

**10, 11, 12**

---

**Course Name**

**Semester 1 – 1<sup>st</sup> Year Student**

**Grade Level**

**Course Description:** Auto Care is a course designed for students who are considering entering the automotive industry as well as those who want to learn the basic fundamentals of automobile service and repair. This course introduces the student to the various automotive systems and goes on to provide the foundations of tool use, basic and necessary vehicle maintenance, and automotive industry terminology. The course also provides information to students to help them access technical information for system service and introduces them to automotive careers and certifications.

**Essential Requirements:**

- Demonstrate and understand automotive literacy and safety
- Demonstrate an understanding of industry tools, measuring tools, and equipment
- Demonstrate an understanding of basic automotive systems
- Demonstrate an understanding of engine design, classification and construction
- Demonstrate an understanding of automotive service
- Demonstrate automotive industry communication and literacy skills

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Recommended to take along with Auto Electric I and Brakes in a 3 hour block**

**Prerequisite Courses:** Math and Science recommended

**Applies toward graduation requirements of:** 1 Career Technical Education credit



**Auto Electric I**

**Credit 1/2**

**11, 12**

---

**Course Name**

**Semester 1 – 1<sup>st</sup> Year Student**

**Grade Level**

**Course Description:** A theory driven class based on time spent in lecture/discussion and hands-on lab activities. The course covers Ohms law, diagnosing procedures, and service procedures of the automobile electrical systems. Students will learn the proper use of the Digital Multi Meter (DMM) using the Snap-on multi meter curriculum. Students will use the A-Tech trainers to diagnose electrical problems in automobile electrical circuits. The second half of the course covers the operation and testing of the automotive battery, starting and charging systems. Students will learn to use the on-line service and repair system Alldata to research diagrams, procedures, and time required to complete various electrical repairs. They will complete repair orders, and calculate the cost of parts and labor for specific jobs. They will then perform the repair on one of the department's vehicles.

**Essential Requirements:**

- Must pass shop safety tests
- Must follow all safety rules in the shop
- Display proper usage of tools including DMM
- Ability to perform Ohm's Law calculations
- Disassemble/reassemble and test automotive electrical components
- Demonstrate automotive industry communication, and literacy skills
- Demonstrate the use of Alldata to complete a repair order.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Recommended to take along with Auto Care and Brakes in a 3 hour block**

**Prerequisite Courses:** Math and Science recommended. Students should have had at least a "C" in Algebra I, Algebra II is recommended.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Auto Electric II**

**Credit 1/2**

**11, 12**

---

**Course Name**

**Semester 1 or 2**

**Grade Level**

**Course Description:** This course is designed to prepare students for diagnosing electrical faults in the automotive industry. Students will become NC3 certified in digital millimeters through the Snap-on Education program. They will also become familiar with digital storage oscilloscopes as well as generic and factory scan-tools. Electric fault insertion equipment is utilized in the classroom for Auto Electric I and II courses to provide simulated electrical system faults. This program builds basic diagnostic skills as well as an understanding of electrical theory and OBD computer systems. The following will be covered in this program.

**Essential Requirements:**

- Ohms Law Review
- Battery, Starting, Charging Review
- Electrical System Schematic Analysis
- DVOM, Oscilloscope and Scan Tool Testing
- OBD I and OBD II Diagnostics
- Computerized Engine Controls and Emissions Testing
- Live Vehicle Fault Insertions
- Engine Sensor/Actuator Theory and Testing

**In the event of over enrollment:**

- ★ **First criteria** for consideration shall be the grade the student earned in Auto Electric I
- ★ **Second criteria** will be the current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Prerequisite Courses:** Students must earn a “C” or better in Auto Electric I, or instructor/counselor/administrator approval.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

<b>College</b>	<b>Credit 1/2</b>	
<b>Automotive Electrical</b>	<b>2 Credits @ City College MSU-B</b>	<b>11, 12</b>
<b>Course Name</b>	<b>Semester 1 or 2</b>	<b>Grade Level</b>

**Course Description:** One Hour-One Semester Class

This is a dual credit course through City College-MSU-B. Students will earn 2 credits in TRID 292 Electrical/Electronic Systems 1 by successfully completing the Auto Electric 2 class. Students in College Automotive Electrical will follow the same curriculum as students in Automotive Electric II.

This course is designed to prepare students for diagnosing electrical faults in the automotive industry. Student will become NC3 certified in digital millimeters through the Snap-on Education program. They will also become familiar with digital storage oscilloscopes as well as generic and factory scan-tools. Electric fault insertion equipment is utilized in the classroom for Auto Electric I and II courses to provide simulated electrical system faults. This program builds basic diagnostic skills as an understanding of electrical theory and OBD computer systems. The following will be covered in this program.

- Ohms Law Review
- Battery, Starting, Charging Review
- Electrical System Schematic Analysis
- DVOM, Oscilloscope and Scan Tool Testing
- OBD I and OBD II Diagnostics
- Computerized Engine Controls and Emissions Testing
- Live Vehicle and System Fault Insertions
- Engine Sensor/Actuator Theory and Testing

**MSU-Billings City College:** 2 credits in TRID 292 Electrical/Electronic Systems 1 will be issued to students who pass the College Automotive Electrical class and complete all TRID 292 competencies.

**In the event of over enrollment:**

- ★ **First criteria** for consideration shall be the grade the student earned in Auto Electric I
- ★ **Second criteria** will be the current daily attendance. Attendance is required and documented.

**Prerequisite Courses:** Students must earn a “C” or better in Auto Electric I unless you obtain instructor/counselor and/or administrator approval.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

<b>Brakes</b>	<b>Credit 1/2</b>	<b>11, 12</b>
<b>Course Name</b>	<b>Semester 1 - 1<sup>st</sup> Year</b>	<b>Grade Level</b>

**Course Description:** Course content provides students the opportunity to acquire marketable skills in diagnosis, repair, and service of hydraulic and anti-lock brakes systems.

**Essential Requirements:**

- Components include: master cylinders, power assist units, hydraulic lines and valve, disc, and drum brakes
- Systems include: antilock systems, parking brakes, regenerative braking, and brake electrical and electronic components
- Understand safety procedures utilized in the automotive shop
- Understand automotive terminology as it pertains to brake systems
- Demonstrate knowledge of brake system theory
- Rebuild and bleed brake system components
- Adjust, machine, and recondition brake system components
- Inspect, assemble, and adjust brake system components
- Demonstrate automotive industry communication and literacy skills

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Recommended to take along with Auto Care and Auto Electric 1 in a 3 hour block.**

**Prerequisite Courses:** Math and Science recommended

**Applies toward graduation requirements of:** 1 Career Technical Education credit

<b>College</b>	<b>Credit 1/2</b>	
<b>Automotive Brakes</b>	<b>4 Credits @ City College MSU-B</b>	<b>11, 12</b>
<b>Course Name</b>	<b>Semester 1 - 1<sup>st</sup> Year</b>	<b>Grade Level</b>

**Course Description:** Course content provides students the opportunity to acquire marketable skills in diagnosis, repair, and service of hydraulic and anti-lock brakes systems. City College MSU-B credit (4 credits) may be awarded with demonstrated proficiency on a written and lab final at the conclusion of the course.

**Essential Requirements:**

- Understand safety procedures utilized in the automotive shop
- Understand automotive terminology as it pertains to brake systems
- Demonstrate knowledge of brake system theory
- Rebuild and bleed brake system components
- Adjust, machine, and recondition brake system components
- Inspect, assemble, and adjust brake system components
- Components include: master cylinders, power assist units, hydraulic lines and valve, disc and drum brakes
- Systems include: antilock systems, parking brakes, regenerative braking, and brake electrical and electronic components
- Demonstrate automotive industry communication and literacy skills

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Recommended to take along with Auto Care and Auto Electric 1 in a 3 hour block.**

**Prerequisite Courses:** Math and Science recommended

**Applies toward graduation requirements of:** 1 Career Technical Education credit

<b>Power Train</b>	<b>Credit 1/2</b>	<b>11, 12</b>
<b>Course Name</b>	<b>Semester 2 – 1<sup>st</sup> Year</b>	<b>Grade Level</b>

**Course Description:** A theory driven class combining equal time on lecture/demonstration and performance/lab (shop) activities. The components covered include, but are not limited to: clutches manual transmission/transaxles, front drive axles, drive shafts and u-joints, differentials and drive axles, and four-wheel drive systems.

**Essential Requirements:**

- Apply basic skills in clutch removal and installation
- Basic skills in differentials
- Basic skill in manual transmissions and transaxles
- Basic skills on industry standards
- Written analysis of power train components
- Demonstrate automotive industry communication, and literacy skills

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Recommended to take along with Engine Fundamentals and Suspensions and Steering in a 3 hour block**

**Prerequisite Courses:** Must pass semester 1 of automotive classes with a grade of “C” or better or instructor, counselor/administrator approval.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Suspension  
and Steering**

**Credit 1/2**

**11, 12**

**Course Name**

**Semester 2 – 1<sup>st</sup> Year Student**

**Grade Level**

**Course Description:** Suspension and Steering is a course that trains students in automotive suspension, steering, and alignment. The course covers the principles of automotive steering and suspension systems and four-wheel suspension alignment. Course content provides students the opportunity to acquire marketable skills in the testing, diagnosis, and repair of steering and suspension components and wheel alignment.

**Essential Requirements:**

- Locate and identify chassis, suspension and steering components
- Understand alignment angle fundamentals
- Rebuild chassis and suspension system to OEM specifications
- Use precision measuring equipment
- Remove and replace steering and suspension components
- Demonstrate final inspections and alignment adjustments of all steering systems
- Demonstrate automotive industry communication and literacy skills

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Recommended to take along with Power Trains and Engine Fundamentals in a 3 hour block**

**Prerequisite Courses:** Must pass semester 1 of automotive classes with a grade of “C” or better or instructor, counselor/administrator approval.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Engine Fundamentals**

**Credit 1/2**

**10, 11, 12**

**Course Name**

**Semester 2 – 1<sup>st</sup> Year Student**

**Grade Level**

**Course Description:** This course is a lecture, demonstration, and performance course. This course will provide the student with a basic understanding of the construction, operational fundamentals, technical measurements, overhaul and rebuilding of a small engine. The small engine is utilized to allow the students to disassemble, repair, overhaul and be able to identify all the operational parts of any engine. The students will have classroom activities that will introduce them to the mechanical parts and operational theory of the engine. Each student will gain understanding of two and four cycle engines theory, safety, fastener tools, equipment, measuring and job skills to apply this understanding. Students will learn to use various on-line parts and repair manuals to determine repair procedures, torque specifications, and replacement part numbers.

**Essential Requirements:**

- Demonstrate proper tool selection and usage
- Demonstrate the use of precision measuring tools.
- Demonstrate an understanding of engine operating principles
- Identification of engine components
- Demonstrate how to disassemble and reassemble an engine
- Demonstrate how to trouble shoot an engine
- Demonstrate automotive industry communication, and literacy skills
- Demonstrate the use of on-line service and parts manuals.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS**

**Recommended to take along with Power Trains and Suspension and Steering in a 3 hour block.**

**Prerequisite Courses:** Must pass semester 1 of automotive classes with a grade of “C” or better, or instructor, counselor/ administrator approval

**Applies toward graduation requirements of:** 1 Career Technical Education credit



**Course Description:**

The automatic transmissions course consists of transmission rebuild, diagnosis, and testing. All students are required to disassemble, measure, identify components, reassemble and test a minimum of four transmissions following industry procedures. Students will also perform a transmission fluid exchange and filter replacement. Upon completion of the transmission labs they will rebuild a transfer case and gain an understanding of all four wheel drive components.

**Essential Requirements:**

- Rebuild 3 transmissions and 1 transaxle
- Rebuild 1 transfer case
- Complete all transmission measurement lab sheets
- Assembled transmission must run through all gears at proper pressures
- Successfully perform fluid and filter changes on live vehicles

**In the event of over enrollment:**

- ★ **First criteria** for consideration shall be the grades the student earned in previous automotive courses
- ★ **Second criteria** will be current daily attendance. Attendance is required and documented.

**TWO HOUR BLOCK**

**Prerequisite Courses:** Students must complete a minimum of four automotive courses to be eligible for 2<sup>nd</sup> year courses unless you obtain instructor, counselor, and/or administrative approval.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Course Description:**

The engines course consists of engine rebuild, mechanical diagnosis, performance testing, and routine maintenance and services.

Student will disassemble, measure, reassemble, and test run an engine. In the classroom students will study different engine systems as well as engine rebuilding techniques.

Students will then complete three timing belts on different model engines and one timing chain on a variable valve timing engine. They will also be tasked with valve adjusts on a flat tappet and on hydraulic camshafts.

Students will finish the semester completing factory scheduled maintenances including cooling, fuel, and lubrication systems services.

**Essential Requirements:**

- Completion of engine repair lab sheets
- Rebuild and performance test an engine following industry standards
- Successfully diagnose common engine malfunctions
- Demonstrate automotive industry communication and literacy skills
- Completion of timing belt and chair repairs
- Perform scheduled maintenance procedures

**In the event of over enrollment:**

- ★ **First criteria** for consideration shall be the grades the student earned in previous automotive courses
- ★ **Second criteria** will be current daily attendance. Attendance is required and documented.

**TWO HOUR BLOCK**

**Prerequisite Courses:** Students must complete a minimum of four automotive courses to be eligible for 2<sup>nd</sup> year courses unless you obtain instructor, counselor, and/or administrative approval.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Early Child Physical Development**  
**Early Child Intellectual Development**

**Credit 1**

**11, 12**

**Course Name**

**Semester 1**

**Grade Level**

**Course Description:** You will gain practical teaching experience in one of the two Career Center Preschools, after learning teaching techniques in the high school classroom pertaining to children’s physical, social, emotional and cognitive development. Opportunities are provided to learn what is entailed in various specialized fields such as special education, speech, physical and occupational therapies and pediatric nursing. Whatever path in life you choose children will likely be a part of it; don’t miss this opportunity to brighten your life and the lives of many children.

**Essential Requirements:**

- Early childhood education training
- Teaching in the preschool
- Lesson planning for preschool
- Observation of preschool children
- Study of areas of child development
- Written evaluations

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**TWO – HOUR BLOCK**

**Prerequisite Courses:** None

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Early Child Fundamentals**  
**Early Child Physical Development**  
**Early Child Intellectual Development**

**Credit 1.5**

**11, 12**

**Course Name**

**Semester 1**

**Grade Level**

**Course Description:** Along with gaining practical teaching experience in the Career Center Preschools and learning techniques pertaining to children’s development, this class stresses thematic lesson planning and teaching through centers. Opportunities are provided detailing specialized fields such as special education, speech, physical and occupational therapies and pediatric nursing. This class provides in depth instruction for those considering early childhood education.

**Essential Requirements:**

- Same as listed above.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**THREE - HOUR BLOCK**

**Prerequisite Courses:** None

**Applies toward graduation requirements of:** 1 Career Technical Education credits.

**Early Child Social Development**

<b>Early Child Emotional Development</b>	<b>Credit 1</b>	<b>11, 12</b>
<b>Course Name</b>	<b>Semester 2</b>	<b>Grade Level</b>

**Course Description:** You will gain practical teaching experience in one of the two Career Center Preschools, after learning teaching techniques in the high school classroom pertaining to children’s physical, social, emotional and cognitive development. Opportunities are provided to learn what is entailed in various specialized fields such as special education, speech, physical and occupational therapies and pediatric nursing. Whatever path in life you choose children will likely be a part of it; don’t miss this opportunity to brighten your life and the lives of many children.

**Essential Requirements:**

- Early childhood education training
- Teaching in the preschool
- Lesson planning for preschool
- Observation of preschool children
- Study of areas of child development
- Written evaluations

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**TWO – HOUR BLOCK**

**Prerequisite Courses:** None

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Children & Careers**

**Early Child Social Development**

<b>Early Child Emotional Development</b>	<b>Credit 1.5</b>	<b>11, 12</b>
<b>Course Name</b>	<b>Semester 2</b>	<b>Grade Level</b>

**Course Description:** Along with gaining practical teaching experience in the Career Center Preschools and learning techniques pertaining to children’s development, this class stresses thematic lesson planning and teaching through centers. Opportunities are provided to learn what is entailed in various specialized fields such as special education, speech, physical and occupational therapies and pediatric nursing. This class provides in depth instruction for those considering early childhood education.

**Essential Requirements:**

- Same as listed above.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**THREE – HOUR BLOCK**

**Prerequisite Courses:** None

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Elementary Internship**

**Fundamentals of Elementary Education**

**Elementary Teaching Techniques**

**Credit 1.5**

**12**

---

**Course Name**

**Semester 1 or 2**

**Grade Level**

**Course Description:** In this internship you are placed with a master teacher in a preoperational age classroom. The academic study emphasized is a foundation in working with the primary age level child. This content is applied to the teaching opportunity in an elementary school.

**Essential Requirements:**

- Lesson planning, observing, teaching preoperational children
- Study of areas of child development
- Written evaluations

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**THREE – HOUR BLOCK**

**Prerequisite Courses:** 2 semesters of Early Childhood classes - Instructor discretion, with a Grade of “B” or better in fall & spring Early Childhood Education courses.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

College EDU Human  
Growth & Development

Credit 1  
3 Credits @MSU-Billings

11,12

---

Course Name

Semester 1 & 2 (Full Year Course)

Grade Level

**Course Description:** This class presents a comprehensive introduction to the study of human development including the developmental capabilities and needs of humans at different ages with respect to the physical, psychomotor, cognitive, social, emotional, and psychological domains that affect all education. The course includes 4.5 - 5 hrs per week lab at the Career Center Preschool.

**Essential Requirements:**

- Early childhood education training
- Teaching in the preschool
- Lesson planning for preschool
- Observation of preschool children
- Study of areas of child development
- Written evaluations

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**One Hour Class that is taken as part of a Two Hour Block (with Early Child Intellectual Development-1<sup>st</sup> Semester or part of a Three Hour Block (with Early Child Fundamentals and Early Child Intellectual Development 1<sup>st</sup> Semester). 2<sup>nd</sup> Semester – This class is taken with Early Child Emotional Development in a Two Hour Block or part of a Three Hour Block – with Child and Careers and Early Child Emotional Development.**

**Prerequisite Courses:** None

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**PLTW Introduction to  
Engineering Design**

**1 Credit (1/2 each semester)**

**9, 10, 11, 12**

**Course Name**

**Semesters 1 & 2 -1<sup>st</sup> Year (Full Year Course)**

**Grade Level**

**Course Description:** This exciting class is intended for students who are interested in an engineering or architectural field. The engineering industry currently has over 1 million jobs available without trained individuals to fill them. Furthermore, the dropout rate for engineering programs is nearly 50%. This program is designed to help students succeed in college and graduate as engineers.

This course teaches problem-solving skills used in the design development process. Models of product solutions are created, analyzed and communicated using the solid-modeling computer design software AUTODESK Inventor. This course, combined with traditional mathematics courses and science courses in high school, introduces students to the scope, rigor and discipline of engineering prior to entering college. Students will understand technology as a tool for problem solving, the scientific process, engineering problem solving and the application of technology. Additionally, students will be prepared for the rigor of college level engineering programs.

**Students are eligible for 3 semester college credits** upon successful completion of the course and college exam.

**Students should definitely be taking or plan to take higher level math and science for 4 years of high school.** Students should be in the top 1/3 of their class. Students should be interested in pursuing a degree in science, math, technology or engineering. Other important traits are: interested in computers, self-motivated, creative with art and design and enjoys solving problems.

For additional information: [www.pltw.org](http://www.pltw.org)

**Essential Requirements:**

- Understand technology as a tool for problem solving
- Understand the scientific process, engineering problem solving and application of technology.
- Understand technological systems as they interface with other systems.

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS / YEAR LONG CLASS**  
**FALL ENROLLMENT ONLY**

Freshman students should have strong Algebra skills, be enrolled in Geometry or Honors Geometry, and be academically driven and organized. Freshmen will be taking this course with upper classmen and accountable for the same standards. Freshmen with these qualities have been very successful in the Engineering Program.

**Required:** Students should be on a 4-year math track.

**Prerequisite Courses: (10th, 11th, 12th Grades) - Enrolled in Geometry or Honors Geometry, (strong Algebra 1 skills), or successfully completed Geometry with a 'C' or better.**

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**PLTW Principles  
of Engineering**

**1 Credit (1/2 each semester)**

**10, 11, 12**

**Course Name**

**Semesters 1 & 2 – 2,3,4 Year (Full Year Course)**

**Grade Level**

**Course Description:** This survey course of engineering exposes students to some of the major concepts they'll encounter in a post-secondary engineering course of study. Students have an opportunity to investigate engineering and high-tech careers and to develop skills and understanding of course concepts. Students employ engineering and scientific concepts in the solution of engineering design problems. They develop problem-solving skills and apply their knowledge of research and design to create solutions to various challenges. Students also learn how to document their work and communicate their solutions to peers and members of the professional community.

This course has been instrumental in helping students choose a post-secondary program of study from the numerous fields in engineering offered in college.

**Students are eligible for 3 semester college credits** upon successful completion of the course and college exam.

**Students should definitely be taking or plan to take higher level math and science for 4 years of high school.** Students should be in the top 1/3 of their class. Students should be interested in pursuing a degree in science, math, technology or engineering. Other important traits are: interested in computers, self-motivated, creative with art and design and enjoys solving problems.

For additional information: [www.pltw.org](http://www.pltw.org)

**Essential Requirements:**

- Apply math and science to the engineering field
- Understand the problem solving process, manufacturing process and application of technology
- Understand technology and its effects on society

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS / YEAR LONG CLASS**

**FALL ENROLLMENT ONLY:**

**Required:** Students should be on a 4-year math track.

**Prerequisite Courses:** Requires a grade of "C" or higher in Intro to Engineering Design

**Applies toward graduation requirements of:** 1 Career Technical Education credit



**PLTW**

**Aerospace Engineering**

**1 Credit (1/2 each semester)**

**10, 11, 12**

**Course Name**

**Semester 1 & 2 - 2,3,4 Year (Full Year Course)**

**Grade Level**

**Course Description:** This course propels students' learning in the fundamentals of flight and rocketry. As they explore the physics of flight, students bring the concepts to life by designing an airfoil, propulsion system and rockets. They learn basic orbital mechanics using industry-standard software. They also explore control systems for unmanned aircraft.

- Students should definitely be taking or plan to take higher level math and science for 4 years of high school
- Students should be in the top 1/3 of their class. Students should be interested in pursuing a degree in science, math, technology or engineering. Other important traits are: interested in computers and are self-motivated.

**Essential Requirements:**

- Students should have an interest in aerospace and flight in general
- Students need to understand the scientific process, engineering problem solving and application of technology

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE-HOUR CLASS/YEAR LONG CLASS**  
**FALL ENROLLMENT ONLY**

**Required:** Students should be on a 4-year math track.

**Prerequisite Courses:** Requires a grade of "C" or higher in Intro to Engineering Design

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**PLTW****Digital Electronics****1 Credit (1/2 each semester)****10, 11, 12****Course Name****Semester 1 & 2 - 2,3,4 Year (Full Year Course)****Grade Level**

**Course Description:** Digital Electronics is the foundation of all modern electronic devices. Think of how many devices you use that are programmable, have memory, or have a hexadecimal display. All of these use digital electronic components and circuitry. In this class students will learn to solder components, build printed circuit boards, design digital circuits, use multimeters/oscilloscopes and build/test the circuits on digital breadboards. College students majoring in the following engineering fields: mechanical, electrical, biomedical, aeronautical, aerospace, computer, industrial or electronics technology and computer networking will be required to learn digital electronics. The major focus of the DE course is to expose students to the process of combinational and sequential logic design, teamwork, communication methods, engineering standards and technical documentation.

This is a continuation of the PLTW engineering program at the Career Center. No prior electronics experience is necessary but this is a second/third year PLTW engineering course and is project-oriented with extensive computer use and practical labs.

**Students are eligible for 3 semester college credits** upon successful completion of the course and college exam.

**Students should definitely be taking or plan to take higher level math and science for 4 years of high school.** Students should be in the top 1/3 of their class. Students should be interested in pursuing a college degree in engineering, science, mathematics, or technology.

**Essential Requirements:**

- Understanding of the engineering design process
- Problem solving, organization, and computer skills
- Willing to work in teams and individually

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE – HOUR CLASS / YEAR LONG CLASS****FALL ENROLLMENT ONLY**

**Required:** Students should be on a 4-year math track.

**Prerequisite Courses:** Requires a grade of "C" or higher in Intro to Engineering Design

**Applies toward graduation requirements of:** 1 Career Technical Education credit

## PLTW

### Civil Engineering & Architecture

1 Credit (1/2 each semester)

10, 11, 12

Course Name

Semester 1 & 2 - 2,3,4 Year (Full Year Course)

Grade Level

**Course Description:** Civil Engineering and Architecture (CEA) is a specialization course in the PLTW Engineering Program. In CEA students are introduced to important aspects of building and site design and development. They apply math, science, and standard engineering practices to design both residential *and* commercial projects and document their work using 3D architectural design software. Students will progress from completing structured activities to solving open-ended projects and problems that require them to develop planning, documentation, communication, and other professional skills.

**Through both individual and collaborative team activities, projects, and problems, students will:**

- A. Solve problems as they practice common design and development protocols such as project management and peer review
- B. Develop skill in engineering calculations, technical representation and documentation of design solutions according to accepted technical standards
- C. Develop use of current 3D architectural design and modeling software to represent and communicate solutions

Students are eligible for 3 semester college credits upon successful completion of the course and college exam.

#### **Essential Requirements:**

- Students should definitely be taking or plan to take higher level math and science for 4 years of high school
- Students should be in the top 1/3 of their class. Students should be interested in pursuing a degree in science, math, technology or engineering. Other important traits are: interested in computers and are self-motivated
- Students need to understand the scientific process, engineering problem solving and application of technology
- Willing to work in teams and individually
- In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

#### **ONE-HOUR CLASS/YEAR LONG CLASS**

#### **FALL ENROLLMENT ONLY**

**Required:** Students should be on a 4-year math track

**Prerequisite Courses:** Requires a grade of “C” or higher in Intro to Engineering Design

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**PLTW**

**Engineering Capstone**

**1 Credit (1/2 each semester)**

**12**

**Course Name**

**Semester 1 & 2 – 4<sup>th</sup> year (Full year Course)**

**Grade Level**

**Course Description:** The Capstone class is the culmination of the Engineering Design, Digital Electronics, Principles of Engineering, and Aerospace Engineering course work. It offers the opportunity for the students to work in design teams to solve problems and meet needs by relying upon their prior knowledge, experience, and practice developed in previous engineering courses. Given that students have diverse strengths, backgrounds, and interests, i.e. computer programming, math, electronics, physics, design, organization, etc., they will be teamed based upon expertise to create diversity within the groups much like the dynamic found in real engineering design teams. Teams will expand upon processes developed in their earlier engineering courses, i.e. brainstorming, field observation and research, professional contact and interviews, documentation, mock-ups, 3D modeling, prototyping, field testing, process recording, proposal communication, etc.

**Students are eligible for 3 semester college credits** upon successful completion of the course and college exam.

**Students should definitely be taking or plan to take higher level math and science for 4 years of high school. Students should be in the top 1/3 of their class. Students should be interested in pursuing a college degree in Engineering, Science, Mathematics, or Technology.**

**Essential Requirements:**

- Apply math and science to the engineering field
- Understand the problem solving process, manufacturing process and application of technology
- Understand technology and its effects on society
- Understanding of the engineering design process
- Problem solving, organization, and computer skills
- Willing to work in teams and individually

In the event of over enrollment first criteria for consideration shall be current daily attendance. Attendance is required and documented.

**ONE-HOUR CLASS/YEAR LONG CLASS**

**FALL ENROLLMENT ONLY**

**Required:** Students should be on a 4-year math track.

**Prerequisite Courses:** Requires a grade of “C” or higher in: Introduction to Engineering Design, Principles of Engineering, Digital Electronics, and Aerospace Engineering and/or Instructor approval.

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Course Description:** Air Operations students will be introduced to current methods, practices, policies and work environment behaviors for airline ramp and cargo sort functions. Students are expected to learn the processes for successfully completing each pre-deployment training including employee orientation, safety on the job, work schedules, and communication. Pre and post-flight data transfer and record keeping, IATA terminology, FAA Safety and Regulatory Familiarization and teamwork methods designed to get the airlines in and out on-time with zero defects.

Students will be expected to pass each training evolution with a satisfactory grade and complete the work assignments as assigned by supervisory staff, on-time, as described in the training with no accidents or unsafe operations. Students will be assigned a mentor to observe and correct deficient behaviors prior to being assigned duties without supervision. Successful completion of training programs allows students to conduct ramp and sort operation per the daily operating plan.

Instructors, will evaluate students for timeliness, attention to detail, ability to follow instructions, safety, productivity, teamwork, scan errors, documentation, math (if doing load plans) correct procedures and overall attitude.

**Essential Requirements:**

- Willing to work in teams and individually
- Basic math skills
- Ability to follow instructions
- Ability to work safely
- Ability to follow a schedule and be timely
- Good attitude in a work environment

In the event of over enrollment **first criteria** for consideration shall be current daily attendance. Attendance is required and documented.

**ONE-TWO HOUR CLASS**

**Prerequisite Courses:** Application and Interview process. Please see your counselor for information

**Applies toward graduation requirements of:** 1 Career Technical Education credit

**Course Description:** Independent Study is a course designed to expand the student's knowledge of a subject and/or to develop skills to an extent not available in the present course selections at the Career Center. The independent study course must involve only one student and relate to a specific discipline.

### 1. Qualifications:

- The student must have superior grades in the selected field of study. His/her academic success must demonstrate exceptional ability and depth of understanding within the chosen field of study.
- The difficulty, complexity, and quality of the study is of paramount relevance of acceptance.
- The student's course load and capabilities must permit a more demanding academic endeavor.
- The student's personal attributes must include a strong sense of self-discipline, responsibility, and task commitment.
- **The student must take a minimum of five (5) academic classes.**
- **Independent Study can be taken only as a sixth class option.**
- The student must be a junior or senior.
- Students must make application for Independent Study by May 1<sup>st</sup> for first semester and by December 1<sup>st</sup> for second semester. Applications can be picked up in the Guidance Center.

### 2. Procedures:

- The candidate shall outline his/her proposed study course. This outline should include the purpose, objectives; techniques employed, and predicted outcomes.
- The outline must be approved by an instructor from the appropriate department. This instructor will remain as the independent course study supervisor.
- The teacher approved study plan must then be approved by the Independent Study team, which is made up of representatives from various departments within the school.
- A course study is to be started at the beginning of the semester.
- Upon completion of the study, the student must present a written summary of his/her study to the Independent Study Team.

### 3. Results and Recognition:

The course-study recognition and evaluation results will be noted on the student transcript. Upon successful completion of the course study, one-half (1/2) credit will be given.

1. **Make sure students follow these steps!**
2. **Select a teacher with whom they wish to work**
3. **Develop a study outline with the instructor.**
4. **Have this outline signed by the instructor.**
5. **Assoc. Principal, the teacher, and the school counselor must sign an acceptance of the independent study.**

**This MUST be completed PRIOR to the beginning of the semester when student will take the class.**

**Prerequisite Courses:** Teacher discretion

**Applies toward graduation requirements of:** 7 Elective credits

School to Career	Credit 1/2 to 1 1/2	12
Course Name	Semester 1 or 2	Grade Level

**Course Description:** Credit may be earned through a workplace experience plan that has been approved by the Career Center Director/and or Assistant Director. School to Career credit should be directly connected to a current course the student is enrolled in at the Career Center.

Specific criteria/standards and a contract must be signed by student and adhered to.

Note: Career Center students can apply for a one-hour class of School to Career.

**This must have an Associate Principal and counselor approval.**

**Prerequisite Courses:** Contract signed by employer indicating hours worked.

**Applies toward graduation requirements of:** 7 Elective credits

